THE

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A WEEKLY RECORD OF CLINICAL MEDICINE AND

SURGERY, WITH THEIR SPECIAL BRANCHES.

LIST OF CONTRIBUTORS,

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ANNUAL ADDRESS

TO THE

NORTH-WEST LONDON CLINICAL SOCIETY.

Delivered at the North-West London Hospital on October 20th, 1897, by

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I APPRECIATE very highly the honour of presiding over the Society for the coming year, but I confess that I regarded with considerable apprehension the responsibility of giving some kind of address which lurked in the invitation conveyed by your hon. secretary, Mr. Jackson Clarke, and, to be quite candid, it was only the fact that he was an old pupil and valued friend which turned the scale and induced me to accept what I felt to be an onerous task. I know that personal considerations ought not to enter into questions of public duty, and that the request of a Society like this ought to be looked upon as a command by any member of the profession ; but I am bound to admit that my sense of duty and of the honour conferred upon me needed to be reinforced by the call of personal friendship and regard.

The purposes and uses of medical societies are various, as are the duties and responsibilities of medical men. The primary and predominant duty of the medical man is to relieve suffering and save life—to cure his patient. A few years ago it was only surgeons who were allowed to use the word cure ; a physician or general practitioner who presumed to speak of cures was told that it was nature who cured, and that his personal contribution to the result was not worthy of the name. I venture to claim the word, however, for all branches of the profession, and to say that to cure our patients is the object for which the profession exists.

Another duty incumbent on every medical man is to maintain the honour of the profession of medicine internally and externally ;—internally by doing to his brother practitioners as he would be done by in every respect, by rising above petty jealousies and suspicions of his neighbours and rivals, by refusing to pander to the weaknesses and follies of patients to whom he ought to be a refuge and strength, by doing nothing inconsistent with self-respect ; externally by resisting, and helping weaker brethren to resist, the pressure put upon medical men by clubs and so-called dispensaries and other organisations, which take advantage of the necessity of making a living and the desire to be of some use in the world, which are powerful influences at the outset of a professional career ; by co-operating in the endeavour to prevent the abuse of medical charities, and to ascertain and redress such abuses as have crept in ; by aiding, again, the efforts to obtain a just recognition, pecuniary and in point of authority, of the public medical services, and by taking a sympathetic part in the great political and social movements in which the profession is concerned.

A third duty which we should all bear in mind, and as far as in us lies carry out, is to advance medical knowledge and medical science.

The North-West London Medical Society is eminently clinical in its objects and methods, and subserves, therefore, chiefly the first of the purposes I have enumerated by illustrating at the

meetings here the diagnosis and treatment of disease. This is as it should be in a local society ; but while new advances in medical science and new views of morbid processes and new principles of treatment are rightly reserved for discussion at the great central societies, much is done for the advancement of knowledge by clinical societies such as this ; principles are brought to the test of experience, suggestions coming from the laboratory are put in practice and the conclusions of science are applied. On the one hand, the ideas of the members are enlarged, and on the other the speculations which clear the way for the progress of knowledge are verified, or corrected, or overthrown.

Much is done also by a Society like this to keep professional honour bright and professional feeling sweet. No charlatan or quack brings his papers or his cases here ; he writes a book on the disease which happens to be in fashion, or sends a communication to a non-professional review. Petty jealousies are dissipated by the free discussions at the meetings, and suspicions and antipathies are drowned in the social cup of tea. I have no business, perhaps, to enter at all upon such a topic on an occasion like this, but the subject of hospital abuse and hospital reform concerns us all so closely that a single word upon it may be permitted.

That grave hospital abuses exist I have no manner of doubt. They are greater and more serious, and at the same time less extensive and less purely mischievous, than is generally imagined. Nothing can be more difficult than the precise identification and demonstration of the abuse of hospitals, except the discovery and application of a remedy. It is easy to say that one third of the population of London cannot possibly be fit subjects for out-patient relief, but I do not accept or believe the statistics which seem to show that this proportion seeks out-patient relief; and while it is a scandal that prosperous tradesmen paying £70 or £80 a year rent should obtain gratuitous advice at hospitals, which I am assured is of every-day occurrence, there are cases in which a man expends all he has for attendance by his family medical man without benefit, and is then relieved at once at some hospital. Then, again, a remedy is not to be arrived at by appealing to abstract principles. Besides the interest of the

proper subjects for hospital relief, and of the medical profession, and the large questions which surround the subject of charitable relief in general, there must be taken into consideration the feelings and motives and prejudices of subscribers to hospitals. Measures suitable for London might be totally inapplicable in the country, and it is clear that quite different regulations would be required in different parts of London. Some central authority armed with the power of the purse is necessary for the investigation and co-ordination of hospital work in London. The Prince of Wales's Fund and the Hospital Sunday Fund are together possessed of the power and, whether they recognise it or not, are vested with the responsibility of such a central authority. I know, too, that many members of both bodies are fully impressed with a sense of this responsibility, and are earnestly desirous of rectifying abuses. Why should they not constitute themselves an upper house and appoint an executive and call together a hospital parliament such as that suggested by the Charity Organisation Society, consisting of representatives of the governors and staffs of hospitals and dispensaries of every kind and grade, together with a certain number of general practitioners from each district of London, for discussion and deliberation? The conflict of interests would bring out the truth, and out of the general desire to improve the working of our great institutions would gradually emerge reform.

But it is time that I came to subjects more nearly related to the work of the Society. You exhibit patients and read cases, and in this I feel sure that the surgeons shine. They always do, and to attend some of our Societies one would think that it was only in surgery that anything was doing, or that any progress was being made. This idea is entertained largely by the general public. It is very natural, but it is very unfair to the general practitioner and to the physician. In the aggregate the general practitioner relieves a thousand, nay, ten thousand times more suffering, and saves ten times as many lives as the surgeon ; but we cannot bring before a society the anæmic girls restored to health and vigour and womanhood, or the wretched neurotics whose interest in and enjoyment of life have been renewed, or the sufferer relieved from daily torture by neuralgia or by some functional derangement, or the patient safely helped by watchful care and judicious and perhaps vigorous

intervention, through a severe attack of typhoid fever or other dangerous acute disease, or the boy whose cardiac valves have been saved by timely and energetic treatment from damage, or the man whose apoplectic stroke has been postponed for ten years by keeping down the pressure in his arteries;—yet this is our daily work. The country doctor who deals promptly and efficiently with a case of placenta prævia saves a life as certainly as the surgeon who ties a ruptured artery, and is called upon to exercise much more personal courage. Even when the surgeon performs some brilliant operation, it is very frequently the general practitioner or the physician who has made the diagnosis and called him in.

No one appreciates more highly than I do the advances in abdominal, thoracic, and cephalic surgery, and no one is more ready to seek the aid of the surgeon when required, but it is a great satisfaction when by means of medical treatment an operation is rendered unnecessary. It is much better for the patient, for instance, to have a syphilitic gumma, which has given rise to intracranial pressure and other symptoms of a cerebral tumour, dissolved by iodide of potassium, than to have it removed by the most skilful operation.

A very short time ago four of us, two eminent surgeons, a general practitioner, and myself, met to discuss the question of operative interference in a case which had begun with general peritonitis and had lingered on for weeks with recurrent pyrexia, persistent distension of the abdomen, varying pain, tenderness, and resistance in the region of the cæcum, and from time to time colic of the small intestine, suggestive of obstruction. The indications of serious mischief about the cæcum, probably originating in the appendix, were very distinct, and it was only because an operation in the condition of the patient would have been attended with unusual danger that delay was counselled. A few pills, containing a grain of calomel with hyoscyamus, quickly dismissed all the symptoms, and no operation was necessary.

Let me relate another case for the second time, because it illustrates a point in diagnosis which has not been familiar to many men whom I have met, and is not therefore probably fully appreciated.

A gentleman travelled on a given Thursday night from the south of France in bitterly cold weather. He was not apparently the worse for it, but on the Sunday morning he was surprised by a spontaneous copious loose action of the bowels, which was for him a new experience. He ate a good dinner on Sunday evening at the house of a friend, but soon afterwards was seized with pain in the abdomen and had to go home. In the course of the night he vomited, and the pain became so severe that he had to send for his medical attendant, who found it necessary to give morphia hypodermically. From this time the pain continued, the abdomen became more and more distended, there was no action of the bowels, and vomiting was frequent. When I saw the patient on the Thursday, the fourth day of these symptoms, it was stercoraceous. It was feared that the case was one of intestinal obstruction, and the surgeon and chloroformist were in attendance. On examination, however, it was found that the abdominal respiratory movements were completely extinguished, and the abdomen absolutely motionless. Now, however much the abdomen may be distended by inflation of the intestine, there is some attempt at respiratory movements in the upper part unless there is also peritonitis. Peritonitis, therefore, was present, and might explain all the symptoms without obstruction of the bowel. But another indication was noted. The abdominal parietes were extremely thin, and through them could be seen the outlines of distended coils of small intestine. These were perfectly passive, and even when handled refused to enter upon peristalsis. Had there been obstruction by a band or other mechanical cause, the mere exposure of the abdomen would have set the coils in motion, and peristaltic action would have been seen to travel from one to another. Still more would pressure and manipulation have produced this result. The intestine, it was obvious, was paralysed by inflammation, and the obstruction was physiological and not anatomical, and the remedy opium and belladonna and not the knife.

The point I desire to emphasise by the relation of this case is the importance of respiratory immobility of the abdominal walls in the diagnosis of peritonitis. If a single indication ever is infallible it is this. Almost the only condition in which it is doubtful is when the patient is deeply under the influence of morphine, when there may be slight movement notwithstanding the existence

of peritonitis or absence of respiratory movements, when there is extreme distension without inflammation.

But it is time that I should justify my position as president of a Society so distinctly clinical as this by some observations of a clinical character; and I do not think I can do better than take up a subject which has recently been before the public in the 'Times' and other newspapers—the rejection of candidates for the army and public services on the ground of unfitness in point of health.

In my judgment this has sometimes taken place on totally inadequate grounds, and I think it may be useful to illustrate from my experience conditions which have led to this — more especially since on similar inadequate grounds boys and young men are not unfrequently debarred from public school and university life, forbidden to engage in games of all kinds, and sometimes condemned to the wretched existence of a confirmed invalid. Occasionally, but much more rarely, lives are refused for insurance.

One of the reasons assigned for rejection is "irritable heart." A young fellow of eighteen or nineteen, who has passed successfully for Woolwich or Sandhurst, presents himself before the medical examiner in a state of extreme nervous excitement; his pulse is beating any number of times a minute, and, perhaps, not quite regularly, and on examination the cardiac impulse is violent and extends over an unduly large area, perhaps lifting the sternum and giving rise to apparent pulsation outside its right border. Any proper appreciation of the sounds is impossible, and there may be murmurs at one or more of the orifices. The breathing will at the same time be short and hurried. But such disturbance of the action of the heart, however exaggerated, is not inconsistent with perfect soundness and efficiency. This is so far recognised that, unless there are valvular murmurs, the boy is usually told to come up again for examination in three or six months. But if he has to face the same medical examiner under similar conditions, conscious of the previous failure, and knowing that his whole future is at stake, the chances are that his heart will again go off at a gallop. It may be said that a boy who is so nervous would perhaps be unequal to an emergency such as might befall him in a soldier's life; but, on the other hand, a highly strung,

sensitive nervous system may be exactly the one which will rise to an occasion and render service of which a more stolid organisation would be incapable.

In such a case the personal and family antecedents would be of extreme importance. If the boy has been good at football and cricket, distinguished in athletics, fond of hunting and shooting, has followed the beagles, there cannot be anything radically unsound about his heart. It would take a great deal to make me reject the captain of the football team of a large school. What frequently happens is that a boy intending to enter the army is taken from school, it may be because of his devotion to games rather than to work, and sent to a crammer's, where long and late hours of study, and restricted opportunities of exercise and fresh air, with possibly unlimited tobacco, impair his bodily vigour and increase his nervous susceptibility. A fair test would be to let a candidate, whose fitness for military duty is in doubt on account of irritable heart, run a mile round one of the cinder paths at his own pace, noting his time, but especially the period at which he got his second wind and how he finished up. Sometimes the simple expedient of letting the young fellow run up two flights of stairs will bring the heart to its senses—a physiological has been substituted for an emotional cause of acceleration of its action.

But a more common cause of rejection than irritable heart is the presence of a murmur perfectly innocent of significance. One of such murmurs is the spurious murmur not unfrequently heard in the apex region, and to the left, which is produced by compression of the overlapping lung by the heart during systole. It simulates closely a soft systolic mitral murmur, but is really due to displacement of air in the lung. It is easily recognised, and distinguished from a valvular murmur by the fact that it is heard only during inspiration or while the chest is full; it is, in fact, an intensification of the inspiratory murmur. Why this pulsatile respiratory murmur should be heard in some people and not in others cannot be stated. It has no unfavorable significance whatever, and almost always disappears as the chest is developed, though it may be heard at any period of life.

Sometimes this systolic exaggeration of the breath-sounds is audible all round the left chest to the back, and indeed over a great part of the

lung, but in this case there are usually pleural adhesions.

The *pseudo*-murmur just described has not in my recent experience been assigned as a reason for rejecting an army candidate; but I have known it to be looked upon as indicative of valvular disease requiring treatment by digitalis, and demanding all sorts of precautions in the matter of exercise. A murmur more frequently considered to be due to valvular lesion, but which has no such significance, is that produced in the pulmonary artery. Its maximum intensity is in the pulmonic area, the third left space half an inch from the edge of the sternum; but it may be audible at the apex, in which case it can be followed from the pulmonic area downwards along the left border of the heart to this point. When at all loud it is usually heard over a great part of the right ventricle, and therefore in the tricuspid area, and it may be audible so far across the sternum as to give rise to a suspicion of aortic obstruction. It is a most capricious murmur, often varying in intensity and character in the same patient; sometimes audible only in the erect position, more frequently making its appearance or intensified when the patient lies down. When it is heard only in the pulmonic area there is little danger of its being looked upon as serious, but its invasion of the mitral or aortic area is regarded with suspicion, and may easily be taken for an independent murmur. It is not, however, heard to the left of the apex, and it can usually be traced continuously upwards to the pulmonic area.

Another means of distinguishing it can also be applied, which arises out of its mode of production, and this makes it worth while referring to its causation. This has been much discussed, and various explanations have been given. I have no manner of doubt that its mode of production is as follows:—The conus arteriosus of the pulmonary artery is usually covered by a layer of lung which intervenes between it and the chest wall, but in a certain number of subjects the lung does not come sufficiently far over the heart, or the overlapping margin of the lung is very thin. When such is the case the systolic bulging of the conus brings its anterior wall into contact with the wall of the chest, and a slight flattening of its convexity takes place, and this gives rise to vibrations in the blood current within, which constitute the murmur. As proof of the explanation here given is ob-

tained by telling the patient to take a deep breath, and hold it. A cushion of lung is brought over the conus, and the murmur disappears, and with it, of course, the extensions which have excited apprehension of valvular disease.

I have sometimes succeeded in eliciting a murmur of this kind, when it was not naturally present, by making the patient lie flat on his back, and exercising pressure over the pulmonic area.

The pulmonic systolic murmur is more common in women than in men, but it is frequently met with in boys and youths. It almost always ceases to be heard when the chest is fully developed, especially when it is expanded by drilling and gymnastics; but it may in some cases be reproduced at any period of life by sustained and violent exertion.

I am tempted to transcribe from my notes a description of the murmurs heard in the cardiac region of a young man of twenty, captain of a public school football team, and distinguished in all forms of athletics. The apex beat was a well-defined push a little outside the normal situation, and the right ventricle impulse was forcible. At, but especially to the left of the apex, was a systolic murmur, very distinct during inspiration, gradually subsiding during expiration, but not always absolutely disappearing. It could be followed round the chest, and was particularly distinct between the scapula and the spine at the usual spot, where it was audible at all periods of the respiratory cycle, though less so at the end of expiration. This seemed to be conclusive of the existence of mitral regurgitation. On further examination, however, the murmur was heard all over the left lung except at the apex anteriorly; it was distinct, though weak, in the supra-scapular region. But besides this there was another and quite separate loud rough murmur over the pulmonary artery, having its maximum intensity in the left third space about an inch from the sternum which disappeared when a deep breath was taken; it was conducted upwards and outwards to the subclavicular region. Taken apart from the murmurs the heart-sounds were normal, and in particular there was no accentuation of the pulmonic second sound.

From previous experience I considered myself entitled to conclude that the left pleura was adherent, and it could be seen that the left half of

the chest was narrower than the right, and that its movements in respiration were markedly less. Probably with general parietal pleural adhesion, there was adhesion of the lung to the pericardium.

I allowed this young man to play cricket and all other summer games, and to cycle. His wind and endurance were very good, and on examination after five months I found him none the worse for very vigorous exercise.

It will, of course, be understood that I am not now referring to the hæmic murmurs producible at every orifice by anæmia. A state of bloodlessness competent to the production of aortic and pulmonic murmurs would be a sufficient ground for, at any rate, a temporary rejection of a cadet.

Other murmurs are heard in the tricuspid area which are perfectly harmless. One is not properly speaking a murmur, but a sort of systolic scratch, which on careful examination is readily recognised as exocardial. It probably corresponds with a white thickened patch often seen in the pericardium over the right ventricle, attributable to local pressure and friction, especially when the lower end of the sternum is depressed. But a real tricuspid systolic murmur may be met with at any period of life, which prolonged observation, extending in several cases over many years, has convinced me to be quite innocent.

Tricuspid regurgitation, since it usually occurs as the last stage in a series of valvular lesions making for back pressure and stasis, is properly looked upon as an extremely grave affection, and this disposes us to regard any reflux through this orifice with apprehension. A systolic tricuspid murmur implies such reflux, and if this were considerable in amount it would constitute an obstacle to the venous return and a disqualification for military service. In no case of primary tricuspid incompetence, however, have I found evidence of any appreciable regurgitation, and it will be remembered that tricuspid regurgitation is very easily detected by the jugular pulsation, enlargement of the liver, and distension of the right auricle to which it gives rise. This tricuspid murmur, which may be musical or blowing, and which may be heard along the lower border of the heart as far out as the apex, so as to be taken for a mitral murmur, is rarely constant; it may be present only in the recumbent or, much more commonly, only in the erect position. It may

even vary during respiration, and become audible only towards the end of expiration. Not uncommonly it is obviously produced by distension of the stomach. I have come to attribute it to pressure on the yielding wall of the right ventricle, where it rests on the diaphragm, which happens to take effect at a point corresponding to the origin of a papillary muscle. The adjustment of the valvular curtains is thus deranged, and a minute leakage is permitted which gives rise to the murmur.

There are mitral systolic murmurs, the result of actual valvular lesion, which are attended with so little regurgitation that they might be disregarded, if it were not for the liability to recurrence of the rheumatic attacks to which they were originally due. The criterion is absence of displacement of the apex-beat and of accentuation of the pulmonic second sound, or undue right ventricle impulse, together, of course, with absence of symptoms.

Many times I have allowed boys to go to a public school with no restrictions as to games except with regard to football, house runs, and training for races, who had been condemned to a life of inactivity. One such boy, who had not even been allowed to walk upstairs, carried off the prize for gymnastics in the contest between the different public schools.

I must not leave the subject of the heart without referring to dilatation. This is not uncommon in boys, especially boys who have engaged in very violent forms of exertion, or who have been at cramming institutions and have taken all their exercise for the week at one time. The apex-beat is outside and slightly below the normal situation, and is diffused over a considerable area; and, when the action of the heart is frequent, the first sound will be short. It is usually taken for granted that dilatation of the heart, when it is found to exist at all, is a fixed condition, and these hearts are looked upon as permanently damaged; whereas the normal heart may vary considerably in its dimensions, and a certain degree of dilatation is extremely common, and is indeed physiological, after severe and protracted exertion. A boy whose heart is in the state just described, the apex-beat diffuse and outside the normal situation, has only to walk smartly across the room two or three times and the apex is back in its place, and its beat is a well-defined

push. This is the kind of result which, when duly exaggerated and mapped out in blue and red pencil, we are called upon to admire and wonder at as a miraculous effect of the Schott treatment. Dilatation of the heart as a disease is unknown at the time of life at which youths enter Sandhurst or Woolwich, in the absence of valvular lesion or adherent pericardium, except as a temporary consequence of diphtheria or typhoid fever, or acute rheumatism or other acute disease, or of anæmia or some debilitating influence. When present it can be remedied by fresh air and exercise and favorable hygienic influences, aided when necessary by tonics.

The medical examiners for the army have a very difficult and ungrateful task. It is their duty to pass into the service only such men as they believe to be sound and vigorous, and competent to face the fatigue and hardships of a campaign. They naturally and properly say that, having a superabundance of candidates, the slightest doubt as to a young man's organic soundness is a sufficient ground for his rejection. There will be no difficulty in replacing him by another whose health and vigour are above suspicion; and it must be remembered that a fashionable reproach brought against the examination system for the army is that it places the military virtues of bodily strength and vigour at a discount, and fills the service with weaklings. On the other hand, it is very hard on a young man who has gained a place on the list for admission to Woolwich or Sandhurst, to have the career on which he had set his heart closed to him, to see his hopes and ambitions and aspirations all wrecked. I am quite certain that these considerations are present to the minds of the medical examiners, and that they issue the fiat of disqualification unwillingly. All I wish to do is to place the results of my experience at their disposal, and also at the service of the anxious general practitioner, who is called upon to tell parents whether their children can be safely allowed to go to school, and to guide them in the choice of a profession for their sons.

Another source of unnecessary alarm and occasional cause of alleged unfitness for public services is the variety of albuminuria called intermittent or cyclical, or the albuminuria of adolescents. The young medical man on entering practice is apt to look very seriously upon albumi-

nuria or glycosuria or a cardiac murmur; but when one has known cases of albuminuria and glycosuria and valvular disease go on for thirty years, these conditions lose some of their terrors, and experienced life assurance officers and boards do not regard any of these affections as implying the immediate and unconditional refusal of a life. We have to learn to distinguish.

I do not remember to have met with this form of albuminuria in connection with military cadets, but I have more than once had candidates for the Indian Civil Service and for other branches of the Civil Service who had been refused on account of it. The examination takes place later, and the course of study is more severe. In one of the cases which came before me, the young man had been told to appear again for examination in three or four months and to place himself under the care of his family medical man. He had been assiduously and carefully treated for catarrhal nephritis, had been kept in warm rooms, and put on milk diet and salines. Under this treatment the albumen became more abundant, and anxiety as to his health and life took the place of anxiety with regard to his career. There were just six weeks to the examination when I saw the patient; but in this time by exercise and fresh air, tonics and mild mercurial aperients, the albumen was dismissed.

Intermittent albuminuria does not arise from kidney disease, and it is not a result of mal-assimilation of food, as has been supposed from the fact that the urine passed early in the morning will contain no albumen, while that passed after breakfast does. It is a circulatory phenomenon, and the reason why the urine passed after breakfast contains albumen is, not that the patient has taken food, but that he has assumed the erect position. If he breakfasts in bed the albumen does not appear; if he gets up and moves about, without taking breakfast, it comes. A young American girl I once saw had no albumen in the urine so long as she remained on one floor, but if she went upstairs it was always said to appear.

The pulse in these cases is unstable, at one time manifesting moderately high tension, at another low in tension. The apex beat of the heart I have always found to be relatively weak, as compared with the right ventricle impulse, which is fairly strong.

The treatment of intermittent albuminuria should

always have for its object improvement in the general tone.   An outdoor life, vigorous exercise, a meat diet, such tonics as iron and strychnine, are the measures required, and a single grain of blue pill, or grey powder with rhubarb, or colocynth and hyoscyamus, is usually necessary once or twice a week.   Under coddling I have known the coagulated albumen occupy a quarter or a third of the column of urine in a test-tube in a patient who ultimately made a perfect recovery ; and one of the most splendid men I ever knew was made a neurotic invalid for life by having been treated for disease of the kidneys when he was merely suffering from intermittent albuminuria.

The members of the Society will, I trust, forgive me for making so poor a return as this short and discursive address, for the honour they have done me in calling me to preside over them.   Perhaps I should have done better to follow the example of one of my distinguished predecessors, and give no address at all.

TWO CLINICAL LECTURES

ON THE

TREATMENT OF TRIGEMINAL NEURALGIA.

Delivered at the National Hospital for the Paralysed and Epileptic, Queen Square, London, by

VICTOR HORSLEY, F.R.S., F.R.C.S.,

Surgeon to the Hospital.

LECTURE I.

THE actual pathological condition known as neuralgia, and which we are called upon to treat surgically when drugs and electricity have failed to relieve, is, according to all microscopic examination, apparently a form of chronic neuritis due primarily to some lesion of a mixed nerve in its peripheral branches, the tendency of which is to progressively ascend the trunk towards the nerve-centres.   Inasmuch as the chief prominent symptom is the pain, the anatomical question then resolves itself into the question of transmission of the affection along an afferent tract, and therefore we must proceed to examine into and arrange the facts according as to whether we are asked to deal

with the portion of the sensory tract between the peripheral end and the root ganglion, or that narrow part between the ganglion and the nerve-centres which is commonly called the posterior root.

I intend to confine these two lectures to that most intractable form of neuralgia which is known as trigeminal, and I am led to do so because I think that we are justified in saying that the treatment of this disease, certainly the surgical treatment, has arrived at a new stage which may prove to be a very considerable advance in our ability to deal with this very severe affection.

I published in the ' British Medical Journal,' 1891, with the help of Dr. Taylor and Dr. Coleman, a sketch of the methods of surgical treatment of neuralgia known at that time, and certain modifications thereof which I suggested, as well as a description of a new operation to divide the fifth nerve behind the Gasserian ganglion, and also a table of cases operated on by myself.   Experience derived during the six years that have elapsed since the publication of that paper leads me to believe that the difficulties which the subject presented in 1891 can in a great measure be now avoided, and the course of action that we propose to the patient rendered more certain.   I propose to deal, however, with the question in very much the same way as before, with the exception that it is, of course, not necessary for me to repeat the historical outline which I then gave of predecessors in this line ; and while saying nothing of our predecessors up to 1891, I shall likewise say nothing about nerve-stretching as a remedial measure for trigeminal neuralgia.   I venture to assert that it is a mere palliative procedure, and that the relief afforded is only of a very temporary duration from a few weeks to a few months.   So, too, simple neurotomy as originally practised by the older surgeons is now practically abandoned, since reunion of the divided portion is so rapid and complete that the relief is only temporary, and therefore although rare cases of permanent (?) relief have been published, I shall not discuss it.

We thus arrive at the condition of the subject in 1897.   I think that we now are in a condition to express a positive opinion as to why the surgical treatment of trigeminal neuralgia is in some cases successful and in other cases unsuccessful.   In reviewing the after-history of the cases that I pub-

lished in 1891, I find that those which failed from recurrence of pain fall into two classes :

(a) Those in which the neuralgia recurred because of reunion of the divided nerve.

(b) Those in which the neuralgia, *i. e.* neuritis (*vide infra*) spread along the stump of the divided nerve and invaded neighbouring branches.

The cases permanently relieved were those in which the disease, as shown by the symptoms, was confined to the branch removed. As regards reunion I have seen that occur in one of the cases referred to after an inch and a quarter of the nerve was removed, and I proved by an autopsy made four years later that the rejoining of the two parts had been complete. Practically, however, this source of failure only applies to branches of the inferior division of the nerve. Inasmuch as in these cases by the operation described in my paper of 1891, a portion of the nerve was excised between the foramen ovale and the foramen of entry into the lower jaw, thus leaving a considerable portion of the nerve in normal relation to the skin and mucous membrane ; a gap only in the course of the nerve was made.

On the other hand, the operation on the middle division of the nerve means extirpation of the whole trunk of the nerve from the skin to close to the foramen rotundum, thus rendering reunion impossible ; but in such cases, of course, there was always the risk of the neuritis spreading to the other divisions of the nerve *via* the Gasserian ganglion, and to that the recurrence of pain should be attributed. This point is, I think, fairly established by the fact that the most common course of attack of the neuritis, *i. e.* neuralgia, is the gradual and successive involvement of that branch which is nearest the first affected.

The object of the following pages is to take advantage of our further knowledge of this subject, especially in the light of the greatly improved operative treatment of this disease by what is known as the Krause or Krause-Hartley operation, and experience of which I hope will ultimately prove that we have at last a means of avoiding the two sources of failure just referred to, and of placing the patient in the position of being permanently rid of this terrible affliction.

Anatomical Considerations.

Speaking of the structure of the fifth nerve itself there are three portions I shall have to refer to. First there are the sensory and motor roots as these are given off the pons, there is next the Gasserian ganglion, and there are lastly the three subdivisions of the nerve ·as they leave the Gasserian ganglion. I make no reference to the subordinate ganglia, such as Meckel's or the submaxillary ganglion ; they have little to do with the present subject, because when surgical treatment is called for, the pathological condition has progressed far beyond their situations.

The roots of the fifth nerve arising from the nuclei in the medulla leave the pons at the junction of its upper and middle third, and run forward with a length of about one centimetre to gain the edge of the superior border of the petrous bone, where, passing loosely through a foramen in the inner layer of the dura mater they slip as it were between the two layers of the dura mater and enter a large lymph space which is known as the *cavum meckelii*. This hollow, which is a space between the two layers of the dura mater, occupies a slight cavity on the anterior or upper surface of the petrous bone.

When the compound nerve enters the "cavum" it is enveloped by the delicate membrane of the arachnoid and pia mater, while the lymph space itself is full of cerebro-spinal fluid.

It is of much importance to recognise that anteriorly the dura mater is extremely adherent to the branches of the nerve peripherally to the ganglion, *i. e.* where they leave the skull, and that an attempt to extract these branches peripherally is customarily attended by failure, since the nerve-trunks rupture in the foramen of exit. It is quite different posteriorly, *i. e.* at the entrance of the "cavum," and we shall see later that it is possible in many cases to detach the roots from the pons and draw them out. The capability of doing this depends wholly on the anatomical arrangement just described.

The sensory and motor roots terminate in the cavum in the structure called the Gasserian ganglion. The ganglion itself consists of a mass of ganglionic tissue and a large quantity of connective tissue, through and over which run the spread-out fibres of the sensory root, and underneath, directed towards the inferior or third division of the nerve, crosses the motor root. The outer aspect of the ganglion as it is approached in

Krause's operation has a very characteristic appearance, which is more conveniently referred to in detail on another page. From the convex border of the ganglionic structure issue respectively the three divisions of the nerve ; but of these the uppermost or ophthalmic is practically the continuation of the upper border of the sensory root, and passing upwards and inwards to gain the sphenoidal fissure lies on the outer wall of the cavernous sinus, to which it is intimately attached. From a point below the middle of the ganglion the middle division starts, and in a line with the lower border of the sensory root the inferior or third division takes origin from the lower end of the crescentic border of the ganglion. Of these three divisions of the nerve, the first or ophthalmic has an intra-cranial length of about 1 cm., but the second and the third divisions only about 3 to 4 mm.

To sum up, then, the intra-cranial portion of the nerve includes—

a. The sensory and motor roots from the pons to the Gasserian ganglion.

b. The ganglion and the commencing portion of the three subdivisions of the nerve.

There remain for description the peripheral portions of these three subdivisions.

As regards the distribution in the various bones and parts of the face, these are important only so far as they involve the question of the possibility of removing the trunk of each division.

The *first* or ophthalmic division extends in the orbit from the inner end of the sphenoidal fissure straight outwards to the supra-orbital notch, and can be reached in any part of its course.

The *second* division issuing from the foramen rotundum lies in the spheno-maxillary fossa, and while giving nasal branches to Meckel's ganglion and the mucous membrane of the nose, turns outwards to gain the middle of the posterior margin of the antrum, lying upon which and covered only by fibrous tissue it enters the infra-orbital canal at a point about the centre of the antral roof; here the anterior dental branch leaves it, and the nerve runs forward through the infra-orbital foramen, to the periosteum, of which its sheath is firmly adherent, and is then distributed in thick branches to the ala of the nose and the upper lip.

The *third* division is more complex. As soon as it leaves the foramen ovale, to which opening it is very adherent, it gives off the auriculo-temporal branch, and then splits up into the lingual and inferior dental trunks, and as these pass under the external pterygoid muscle, muscular branches are distributed to the pterygoid, masseter and temporal muscles. The trunks lie behind the vertical ramus of the jaw, in which region they can be easily dealt with through the sigmoid notch by various operative procedures, including the one I published in 1891. The further course of these branches requires no description here.

Pathological Introduction.

Our next step must be to discuss the pathology of trigeminal neuralgia, because with a full understanding of the same it is easy to recognise the reason of success and failure in treatment. At the same time, in some cases it is very difficult to correctly discover the cause of the trigeminal neuralgia, although the nature of the disease is such that its invariably sudden onset ought, we should think, make the discovery of the cause easy. I would suggest that examination of typical cases of trigeminal neuralgia shows that the commonest causes arranged in order of frequency are—

1. Cold.
2. Worry.
3. Alcohol.
4. Osteitis of the alveolar borders of the jaws due to dental caries.
5. Rhinitis.
6. Traumatism.

To consider these causes in further detail we may group the first three together.

1. Cold.
2. Worry and overwork.
3. Alcohol.

That cold should be a frequent cause of trigeminal neuralgia, premising also that that condition is one of neuritis, quite coincides with other observations, namely, that the mischief begins in the peripheral branches of the nerve, and that cold is in general a frequent cause of neuritis. As regards worry and overwork, undoubtedly almost all these cases occur in persons of middle life, and those who have been subject to mental worry and anxiety, but especially persons who are neurotic. Alcohol probably plays a considerable *rôle* as a contributing factor, though it is extremely difficult to say that trigeminal neuralgia is ever, strictly speaking, alcoholic neuritis. The difficulty of determining

this accurately lies in the fact that these patients fly to alcohol as a remedy, and hence may, in some instances, become victims to alcoholism, as not a few unquestionably are.

4. Osteitis of the alveolar borders of the jaws due to dental caries.

I have several times seen dental caries leading to chronic osteitis in the tooth socket produce typical trigeminal neuralgia, confined first to the anterior dental nerve (in all the cases in which this mode of origin was clearly established it happened to be the upper jaw); and after the anterior dental had for some time been the seat of pain, it next invaded the main trunk of the infra-orbital, *i.e.* including the cutaneous distribution of the same. Under these circumstances we have an ascending neuritis of perhaps simple septic origin.

A certain number of cases have been published from time to time in which localised inflammation and ulceration of the mucous membrane of the nose has started trigeminal neuralgia, first in the nasal branches supplying the mucous membrane on the turbinated bones, and then on the septum, then creeping upwards and so reaching Meckel's ganglion, and therefore ultimately the main trunk of the infra-orbital. Local treatment has in several cases relieved the pain for a time.

5. Traumatism operates usually under two circumstances, *i.e.*

(*a*) Local injury to the nerve-trunks as they pass through the bones.

(*b*) Local injury to their peripheral branches.

(*a*) In fracture of the base of the skull sometimes the fracture runs through one or other foramen. If it passes through the foramen ovale or the foramen rotundum, then hæmorrhage in the sheaths of the nerves occurs; and since the attachment of the dura mater is, as before said, tense, such hæmorrhage leads to intense pain, ultimately becoming persistent, and so setting up neuralgia.

(*b*) Crushing of the tissues of the face from a severe fall, a kick of a horse, or a gunshot, by injuring the nerve-fibres in the skin or the cutaneous tissue, is undoubtedly in some cases a definite cause of the neuralgia, simply originating by bruising, hæmorrhage, &c.—a neuritis which ascends towards the pons.

The pathological changes brought about by the foregoing causes, and now to be investigated in this disease, are naturally grouped as follows :

(*a*) Changes in the peripheral nerve-trunks, *i. e.* in and among the nerve-fibres.

(*b*) Changes in the Gasserian ganglion.

(*c*) Changes in the roots of the ganglion.

(*d*) Changes in the central nervous system.

(*a*) Changes in the peripheral nerve-trunks. In all cases that I have myself examined I have seen no changes in the nerve-fibres themselves, but the epineurium in every instance is shrunken and sclerosed. The fasciculi of the nerve-fibres are brought together, and the connective tissues shrunken closer together ; there is, in fact, sclerosis and cicatrisation. But in accepting this as the constant change observable, it is to be remembered that these cases do not present themselves for removal of the nerve until the latter has been affected for at least five or six years ; consequently, we can only admit that we are probably investigating the final stages of a condition which, at its outset, might have shown the very different picture of active congestion and œdema. I am not aware of any instances where opportunity of examining the nerve in early stages has occurred. Dana has been led to attribute the change entirely to a secondary sclerosis, due to degeneration of the vasæ nervorum. I have also observed in certain instances the co-existence of endarteritis, but in a number of cases the vessels are healthy.

(*b*) Changes in the Gasserian ganglion. The next point is the important question, how far the changes in the peripheral branches also exist in the Gasserian ganglion. Krause found that the ganglion cells were some of them markedly shrunk, and in others the nucleus was not visible. Some were found strongly pigmented and vacuolated, while among normal cells completely degenerated ones were to be found. I have not myself seen more degeneration than would seem to be accounted for by the age, condition, and habits of the patient, but have in three cases found both the ganglion and roots firmly matted by adhesions to the walls of the cavum Meckelii.

(*c*) Changes in the central roots of the ganglion, and

(*d*) Changes in the central nervous system.

I am only aware of one case in which these parts have been examined, viz. by Dr. Taylor for myself from a patient of mine (case published in the 'British Medical Journal,' 1891) ; but the examination proved wholly negative. Should the absence

of changes in the central roots be confirmed by the observation of others, it would speak strongly for the view which I venture to think is practically proved by the surgical history of the disease, namely, that a case of trigeminal neuralgia is one of an ascending peripheral neuritis.

I hope, but cannot yet say that it is more than hope, that I shall be able to show you that there is good ground for believing what is suggested by the foregoing consideration of the anatomical changes, namely, that the *Gasserian ganglion affords a bar* to the further progress of the disease. It goes without saying that if we can establish that at the onset it is a most welcome fact, for we could then feel assured that all we have to do was to divide the nerve behind the ganglion to obtain a permanent cure for our patients.

A further anatomical condition observable in trigeminal neuralgia is a definite increase of intra-cranial tension. Since the general adoption of Krause's operation opportunities have occurred of noting the state of affairs in the skull, and the bulging of the dura mater into the trephine opening is striking. There is further an excess of cerebro-spinal fluid.

The next matter for consideration is the discussion of the effects which the neuritis produces, in other words the symptoms.

Effects of the Neuritis.

Inasmuch as the pathology of this severe affection still remains somewhat a matter of discussion, it is worth while, although the clinical history of a case has been so often described, to recount the symptoms in a summarised form in order that their special characteristics may be compared with those observed in other cases of undoubtedly ascertained peripheral inflammation of nerve-trunks. The most pressing feature is of course the pain; and the troubles to sensation, in fact, are all summed up in the word pain. While the attack is on, the skin is in a condition of hyperæsthesia, which is so intense that the patient often cannot discriminate points, &c., he can only feel the pain. Pain from the point of view of exact diagnosis in nerve disease is a bad guide in dealing with central organs, as in the cerebrum or cerebellum, where it is the most misleading of all symptoms; but in this peripheral affection of the fifth nerve the pain is most useful, and apparently a clear and unmis-

takable symptom. In the first place we must consider its onset, next the mode in which it develops, the duration of an attack, and above all its precise seat.

1. Onset.
2. Mode of development.
3. Duration.
4. Decline.
5. Seat of apparent origin.

The reason why so much attention should be paid to the details of the pain is because our surgical intervention depends upon whether we can define first the seat of origin of the pain, and whether also we can define its exact distribution.

1. *Onset.*—The first characteristic of trigeminal neuralgia is that the pain begins with, as a rule, great suddenness. There is a lightning shoot of pain, usually in the distribution of one branch of one division of the nerve, and in this respect it corresponds to the shooting characteristic pains in peripheral tabes, alcoholic and other forms of toxic neuritides. Exceptionally, in a very bad case, there may be before the occurrence of the sudden shock or shoot which marks the onset of an attack, a peculiar intermittent ticking or beating in the region of the nerve-trunk. Such a subordinate or initial pain is also noticed in other varieties of peripheral neuritis, especially those marked by sclerotic change.

The attack begins usually while the patient is doing something which mechanically pulls on the peripheral branches in the skin, mucous membrane, or deep-seated trunks, *e. g.* while eating or speaking, and then it occurs as a sudden shoot constantly arising from one and the same point.

2. *Mode of development.*—After the preliminary shoot, which as we have just stated is localised strictly to one branch of the nerve, a pain of a varying character, *i. e.* either burning, or twisting, or boring, rapidly spreads over the neighbouring or associated branches until it has affected a large area, and also until it occasionally calls up characteristic neurasthenic pains, *i. e.* a sharp and severe pain at the bregma, and also pain, usually a dull aching, in the distribution of the great occipital nerve.

To illustrate how the mischief spreads take the history of this case of neuralgia of the middle division. The patient states that the pain began

apparently in the sockets of the teeth after caries of the latter,—starting, in other words, with a purely local neuritis. The patient next says that it spread to the temporal region ; this is because the neuritis creeping along the main trunk affected the temporo-malar branch, and later that the pain came into the ear. The fact that in its regular sequence the auriculo-temporal nerve was the next to be attacked means that the mischief had arrived at the ganglion and began to attack the inferior division. The first branch given off this division immediately outside the foramen ovale is the auriculo-temporal nerve. Later, the patient says the pain went down the jaw, that is down the inferior dental, while still later it attacked the lingual, and latest of all the ophthalmic division. It is interesting to note that the ophthalmic branch runs from the further part of the ganglion, while the middle and inferior are nearer to one another. Perhaps this proximity and structural continuity will explain the common method of spread of the mischief. In all cases the clinical history is graphically anatomical, for the attack is precisely in anatomical order of proximity of nerve-trunks.

Duration.—It is interesting to see how constant, relatively speaking, the duration of the pain is. In the vast majority of cases the paroxysm lasts for about half a minute, a fact which is the only one which would seem to suggest that any central mechanism was involved at all. We know, for instance, that a cortical discharge usually is completed within two minutes, and thus seems to have a definite duration. With the peripheral nerves the case is different, though only in degree, in the majority of cases lasting about half a minute, and so the disturbance seems to have also a certain physiological duration.

Decline.—The termination of the onset is usually preceded by a diminution in the extreme severity of the pain, when it often leaves off quite suddenly ; occasionally, however, it leaves a numb "ticking" feeling.

Seat of apparent origin.—A great deal turns in trigeminal neuralgia on the exact determination of the seat of the origin of the pain, because the position which I shall endeavour to maintain is that in a genuine case every occurrence of pain in the distribution of the branches of the fifth nerve means that these branches are actually the seat of a neuritis, the obvious deduction from which is that any opera-

tive procedure designed to cure the case must include the removal of all such branches. Of course, the branch in which the pain starts is usually quite determinable ; a patient can always indicate the point from which the pain radiates. A more difficult question is the gradual spreading out of the area of pain.

Allusion must here be made to the view held by some that in such cases (*i. e.* of extension) there is actual organic disease in but one branch, and that the pain which occurs in the other branches is only what is called reflected or reflex, or referred pain. This matter of reflected pain is interesting hypothetically, but I do not believe that it occurs in trigeminal neuralgia; whence it follows that if there is extension of the area, there must also be a real involvement of the nerves supplying the extended area. Confusion must not be made here between real trigeminal pain and the bregmatic and occipital pain of the secondary neurasthenia which occurs in these cases, and to which reference is made later.

I always doubted the actual occurrence of reflected pain, but no opportunity of testing the point has occurred to me until quite recently. I saw the following case with Dr. Jackson, in which it seemed, from the strict localisation of the onset, that the pain in the other branches was really of a different character and degree, and might very well be "reflected." A woman had localised neuralgia in the area supplied by the middle division, this being a case in which apparently we could only prove that the portion of nerve inflamed was this second division. She did complain of auriculo-temporal pain, but had not the true pain in the lower jaw, although it shot downwards a short distance. I ventured to lean back on this old notion of reflected pain, and thought that perhaps in view of her age and weakness it would be more proper to do the superficial operation, and I believed myself that it would stop the whole trouble. So resting on this doctrine of reflected pain, I did the superficial operation, viz. removal of the infra-orbital nerve tentatively, to see if it would meet the existing condition, but it proved to be quite insufficient ; and I will show you now the same patient on whom I later performed Krause's operation a month ago, and from whom consequently the pain was immediately removed. A case of this kind, though not a scientific test, is

nevertheless sufficient to warrant one in putting the onus of proof on to those who believe in the existence of such a thing as reflected pain. This is no academic point. The practical bearing of it is exemplified in the case I now show you. If there is really no such clinical entity, then it is obvious that if any operative procedure is to be undertaken it must include all the branches which examination seems to show are affected.

The next point in the character of the neuritis is the frequency with which it attacks the right side of the face. It may only be accident, but in about 70 per cent. of these cases that come under my notice it is the right side alone which is the seat of the disease. In close connection with this matter we may anticipate what will have to be said under the question of differential diagnosis by saying that in the real trigeminal neuralgia the mischief is strictly unilateral, and in this respect affords a sharp contrast to the functional variety.

Not only is this true of the developed condition, but also the pain in the functional variety crosses to the other side, and later may return—a transposition of the condition which I have never seen in the real neuralgia, except in one case of osteitis due to dental caries. (See later, "Differential Diagnosis.") It is incumbent upon us, therefore, to mark out precisely the distribution of the branches of the fifth nerve. There can be no mistake here, because the anatomical arrangement is so very plain, but in this connection one observation of precaution is worthy of expression. Supposing we have to do with a patient in whom the pain commences in the infra-orbital division. He will say that when eating (*i. e.* with the orbicularis oris in motion), the pain in its radiations will pass through the floor of the orbit. Contrary to possible expectation it will be found on examination that the pain does not go along the line of the supra-orbital nerve, it does not spread over the forehead, but that it goes into the temporo-malar branch into the ear and along the course of the auriculo-temporal nerve. Following the pain in this distinctly anatomical fashion you cannot be misled, you know exactly how you stand in regard to the affected branches; but he will then tell you of other pains, and will point to the bregmatic region, and very often patients point to the occipital region. Now the bregma or upper border of the frontal region is supplied

by the end of the supra-orbital nerve, but the patient will not describe any pain in the remainder of the supra-orbital division, and therefore the bregmatic pain has not the character of pain produced by the neuritis of trigeminal neuralgia, viz. that which begins in the peripheral portion and travels towards the central end. These bregmatic and occipital pains occupy, in short, the characteristic seats of neurasthenic pain in patients suffering from nervous exhaustion from any cause, *e. g.* overwork, or the effects of a railway accident. They are misleading pains due to the nerve depression caused by the attacks of pain; they have nothing to do with the pain of the neuralgia itself, and therefore are to be strictly discounted in localising the seat of mischief.

The Physics or Applied Mechanics of the Nose, Upper Respiratory Tract, and Lungs.

BY

MAYO COLLIER, M.S.

THE correct diagnosis and treatment of the various functional derangements and pathological conditions found in the respiratory tract, is influenced by and dependent on a proper understanding of the laws that govern and are associated with the taking in and giving out of air, constituting the act of respiration.

The act of respiration is in itself unique and peculiar, and the tissues that line the respiratory tract are constantly affected by laws and circumstances that do not pertain to any other tissue of the body. The respiratory apparatus consists of a suction and force pump—the chest walls and lungs ; a patent and more or less rigid tube—the trachea—leading into the common alimentary and respiratory chamber—the pharynx,—which again leads into the alimentary and respiratory vestibules —the mouth and nose.

Now, be it observed that the alimentary and respiratory tracts cross in the pharynx, and at the point of crossing valves are placed to prevent the improper admixture of the alimentary and re-

spiratory streams. The valve of the glottis and the valve of the palate effectually prevent the passage of food into the post-nasal or laryngeal chambers.

Again, the alimentary and respiratory tubes respectively, after crossing in the pharynx, end in corresponding vestibules—the mouth and nose.

These expansions or chambers are shut off from the outside world by valves, and are provided with organs and glands and apparatus whose duty and function it is to duly prepare the food and air for the alimentary and respiratory organs.

In the same way that it is absolutely requisite for the due performance of the digestive functions that the teeth and various glands in the mouth and pharynx should duly perform their allotted tasks, even more so is it essential for the proper performance of the respiratory function that the nasal laboratory should duly prepare the aërial food necessary for the respiratory organs. To warm, to moisten, to filter, is the main function of the nasal workshop. To divide, to moisten, to chemically change, is the main function of the oral workshop. If unprepared food or air habitually enters the alimentary or respiratory organs respectively, sooner or later functional derangement of these organs supervenes, due to pathological alterations in their lining membranes, as evidenced by dyspepsia on the one hand, and dyspnœa on the other.

The outline of the anatomy and physiology of the respiratory tract having been touched upon, we are now in a position to contemplate the action of respiration under various normal and abnormal conditions. Both nasal passages may be normally patent, one only or both may be closed, with many gradations between these marked states.

Under normal conditions both nasal cavities are symmetrical, and the septum stands in a vertical antero-posterior position separating these cavities. Normally an equal volume of air should traverse each nasal cavity, and the total of this should be sufficient to allow of some fifteen to twenty noiseless respirations per minute, and allow this to be effected without the knowledge or consciousness of the individual. The individual should not be conscious of possessing an organ for respiration at all.

Under these circumstances the variations in the tension of the air in the lungs are equalised rapidly and completely by the ready inflow from the upper respiratory tract, and at no time is the air in the lungs so rarefied as to interfere with the normal circulation in the lining membrane of the bronchial tubes. This is normal inspiration. The inflow and compensation of tension due to the expansion of the chest walls is immediate, admitting at no time of any but a small variation in the intra-thoracic pressure.

The same is true of the upper respiratory tract.

The inflow of air is so ample and immediate, that at no time under normal circumstances is there any but the most minute variation in the tension of the air in the various parts of the respiratory tract. As in the lungs so in the upper respiratory tract, under these conditions of normal respiration no engorgement of the lining membrane of the nasal cavities or post-nasal space can take place.

This, then, is normal inspiration, and normal inspiration is effected without sensible lessening of tension of the air in any portion of the respiratory tract, the compensation of the inflow being so ample and immediate.

Now contrast this state of things with what must inevitably occur if the inflow of air be insufficient or delayed.

When the powerful inspiratory muscles expand the chest walls, the lungs must follow suit at the cost of rarefying the air in these organs.

The lessened intra-thoracic tension means a disturbance of the balance of intra-vascular and extra-vascular pressure. The extra-vascular pressure being lessened, general engorgement of the whole bronchial mucous membrane takes place from vascular dilatation.

Now let us examine the effects of a diminished supply of air in the upper respiratory tract.

Take the case of one nostril being obstructed partially or entirely. The current of air down the other nostril will flow more rapidly to compensate for the loss of current in the closed nostril. The current through the unobstructed side will exhaust and rarefy the air in the closed or partly closed side. The lessened tension here again will cause a disturbance in the balance of intra- and extra-vascular pressure, and result in engorgement of the whole lining membrane of the closed side of the nose and accessory cavities therein.

In cases of marked one-sided obstruction the difference in intra-nasal and extra-nasal or atmospheric pressure may be so great as to gradually crush in and alter greatly the shape of the nasal box.

In the growing skull of young persons the palate, nasal septum, and outer wall of the nose are frequently irreparably approximated, leading to much distortion and loss of symmetry in the face. If both nostrils be partially or wholly obstructed, the stream of air passing through the oropharynx to the lungs will draw out and exhaust the air in both nasal cavities, leading to a general engorgement of the lining membrane of both the post-nasal and nasal spaces, and so causing an abnormal pressure on the outer surfaces of both nasal chambers. During oral respiration the stream of air is more than sufficient to equilibrate the tension in the lungs without leading to a disturbance of the vascular equilibrium in the lining membrane of the bronchial tubes, provided the individual be conscious or awake.

During sleep the conditions are somewhat altered, the breathing is slower, deeper, with greater effort, and some opposition to the inflowing stream is offered by the approximation of the root of the tongue to the soft palate.

The breathing is laborious and noisy, and the air does not enter the lungs in the steady stream requisite to equilibrate the intra-thoracic tension, without disturbing the vascular balance. Chronic bronchial or morning catarrh is the expression of this altered physical condition.

Now in these few lines I have endeavoured to point out and show how any obstruction to the free inlet of air to the lungs, *viâ* the upper respiratory or oral tract, leads to serious functional disturbance, and ultimately, if prolonged, to permanent damage, not only to the lining membrane of the bronchial tubes and upper respiratory tract, but under certain conditions of age and tissue to serious alteration in the lungs and chest cavity.

If this state of things is coincident with the developing period of life, the most serious alterations may occur in the shape of the face, as well as the palate, teeth, and whole upper jaw.

We will now examine the forces that are brought to bear during nasal obstruction a little more closely, and if possible gauge its amount, even if only approximate.

If a bent piece of glass tube with mercury in the bend be attached to a fairly rigid elastic tube, and this tube in its turn be inserted into one nostril so as to carefully fit that nostril and allow of no air passing by the sides of the tube, we shall note the following phenomena, and shall endeavour to interpret the same in terms of atmospheric pressure. During each inspiration the mercury will rise in the proximal limb—the limb to which the nasal tube is attached—and fall in the other. The extent of the rise and consequent fall will vary with the strength of the inspiratory effort.

Now what is the explanation of this phenomenon? Why does the mercury rise during inspiration and fall during expiration? During inspiration the muscular expansion of the chest walls dilates the lungs and so expands the air contained therein, leading to a loss of balance between the intra-thoracic and extra-thoracic pressure. This loss of balance sets up a current of air that passes through the open nostril (the mouth being closed) into the lungs; the stream of air passing through the nasal chamber and post-nasal space will draw out the air and exhaust the closed nasal chamber, setting up here also a difference in tension between the intra-nasal and extra-nasal or atmospheric pressure. Air will endeavour to flow into the closed nasal cavity (consequent on the loss of balance), through the glass and elastic tubes, to equilibrate the lessened tension in the nasal chamber, and in so doing will push up the column of mercury. The height of the column of mercury is a register of the degree of rarefaction of the air in the nasal chamber, as well as a register of the atmospheric pressure on all the walls of that nasal chamber during that particular inspiration. Now for illustration let us assume that the rise of the column of mercury is one inch, and see if we can express this in terms of pounds of pressure. The total weight of the atmosphere equals about twenty-nine inches of mercury at the sea level; one inch of mercury, then, will represent a pressure of about half a pound on every square inch of nasal chamber wall exposed to this pressure. Taking the septum as more easy of superficial measurement than any other wall of the nasal chamber, we find that on an average it has a superficial area of about nine square inches. This measurement will give us a force of four and a half pounds of pressure on the wall of the septum during each inspiration, a force which if divided by ten would be quite capable, if acting for any length of time, of causing the most marked distortions and deflections of this particular wall of the nasal chamber. It is not difficult under the circumstances to believe that a thin, partly cartilaginous and partly bony partition, subjected to this pressure intermittently some twenty thousand times a day, will collapse and be driven in, causing a permanent narrowing of the closed or obstructed chamber.

More than this, if the bones of the upper jaw and face are not solidified and fully developed, it is not hard to believe that this varying but ever present force will so influence the growth of the upper jaw from without as to produce an appearance of atrophy, and cause obliteration of the nasal chambers by the gradual approximation of its walls.

Curiously enough, this state of things may be produced artificially and at will by simply inserting a pledget of cotton wool in the nostril of young, growing animals. Ziem, who has undertaken these experiments, is very clear on the subject. He has proved that every obstruction of the nose exerts widely spread consequences on the development of the skull in young animals, one of whose nostrils he completely closed for a long time.

There was seen a deviation of the intermaxillary bone and the sagittal suture towards the shut-up side; also lesser length of the nasal bone, of the frontal bone, and the horizontal plate of the palate bone, less steep elevation of the alveolar processes, smaller distance between the anterior surface of the bony auditory capsule and the alveolar process, also between the zygomatic arch and supra-orbital border, and smaller size and asymmetrical position of the vascular and nerve canals on the closed side of the nose. The distance between the two orbits from the middle line was unequal, which, as has been observed in man, leads to asthenopia, astigmatism, and strabismus.

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TWO CLINICAL LECTURES

ON THE

TREATMENT OF TRIGEMINAL NEURALGIA.

Delivered at the National Hospital for the Paralysed and Epileptic, Queen Square, London, by

VICTOR HORSLEY, F.R.S., F.R.C.S.,

Surgeon to the Hospital.

LECTURE II.

Effects of the Neuritis, i. e. Symptoms.

AMONG the further symptoms which are sometimes observed in these cases, the first now to be mentioned is one which has been referred to by Trousseau. It is exhibited by patients who, though saying that they are not necessarily attacked by an onset of pain at the time, nevertheless suddenly fall as though they lost consciousness, but they recover themselves almost directly, and assert that they do not lose their senses.

In the operation by John Bell referred to before, and in which neurotomy was performed by him without anæsthesia, the sudden stimulation of the nerve produced this symptom, and as he illustrates it so well in his characteristically graphic description of his operation I will quote his actual words :

" I seated my patient in a chair, and pressing the point of my forefinger deep into the hollow where the nerve lies, cut it across by striking in a small sharp-pointed knife, making no length of outward incision, and hooking the point of the crooked bistoury behind the nerve: in the very instant of the stroke by which it was divided, Capt. G— started from his seat, ran forwards in great confusion, exclaiming, ' Good God ! what's that ?' He sat down instantly in perfect composure, free from pain, unconscious of the operation being performed, and expecting it. When questioned about the sensation which made him start up, he said he felt nothing but as if he had been shot in the head, followed by a momentary confusion and a total relief from pain. He said he did not imagine the operation done, because the first operation had been a deliberate dissection. He felt now perfectly confident that he was cured, and returned home in two days, since which time he has lived in perfect health, is happily married, and continues well at this moment ".(' Bell's Surgery,' vol. iii, p. 251, London, 1826).

This intellectual confusion is what these patients suffer from and makes them fall down. It is a prominent symptom in certain cases, and is of course a very transitory loss of consciousness.

The next feature to be described is the occurrence of trophic or vaso-motor change in the areas supplied by the affected branches, the structures involved, in which alone changes are observed, being the skin, mucous membrane of the mouth and nose, and the cornea and conjunctiva. The effects may be divided into—

  (*a*) Vaso-motor,
  (*b*) Trophic,

though this distinction is a very artificial one, changes occurring in the vessels under all circumstances.

(*a*) *Vaso-motor changes.*—In all cases the skin of the affected part becomes chronically congested, but this in a great measure is due to external applications of various kinds being employed as

anodynes or counter-irritants, and also to the fact that most patients when the paroxysm is on, rub the skin or press it. The conjunctiva becomes markedly injected. Whereas all these conditions can be easily produced by the external causes named, still there is a very marked and special circulatory phenomenon in a severe case, viz. localised œdema in the distribution of the branch attacked, and this does not subside until the nerve has been removed. The commonest parts to show this are the lips and eyelids, which may often become œdematous. Such a condition is clearly precisely similar to that known as angio-neurotic œdema.

(*b*) *Trophic changes.*—On this important question I cannot enter into much detail as to whether the Gasserian ganglion has any direct relation to the nutrition of the eye. The experience of surgeons on this subject is, I think, now sufficiently clear to show that our old ideas of the trophic influence of the fifth nerve on the eye were a little too absolute in one or two directions, and the experimental evidence was contradictory. When there is such diametrical opposition on a matter of simple observation it is usually due to the fact that the phenomenon is a simple effect produced by several concomitant factors, and so while one observer has discovered one factor, another observer may not be able to observe it, but finds an additional one. The fifth nerve like every nerve has a trophic influence, and helps the healthy metabolism of the eye; if this is impaired and the eye is particularly well taken care of, the eye will not suffer; but if we have total paralysis of the fifth nerve, the introduction of another factor, such as incautious use of disinfectant lotions or chloroform, will often determine the severest trophic disturbance. I have seen two cases of this kind in which the eye was lost, and as the matter is one of great practical importance will give them in a little more detail.

In the first, which is that of an old man, there was in the eye of the side operated on a slight conjunctivitis from the time of the operation, and gradually the cornea became involved and hypopyon occurred.

In the second case the patient was a much younger man. There was again slight conjuctivitis from the time of the operation, although in the second case, unlike the first, the eyelids had

been secured together by a stitch. Unfortunately this conjunctivitis was aggravated by contact with some sal-alembroth wool, which had been added to the dressing in order to provide a suitable aseptic catchment for the cerebro-spinal fluid and discharge from the drainage-tube. Where this wool accidentally touched the outer canthus the conjunctivitis became much worse, and an extensive but quite superficial ulcer of the cornea followed.

Thanks to the advice of Mr. Tweedy, who kindly saw the patient also, the mischief notably subsided, so much so that the patient was enabled to go into the country, and for some considerable time the eye appeared to be progressing favorably. Later, however, the keratitis returned, and ultimately the eye was lost. I think the history of these two cases shows clearly that at the time of the operation, or very shortly afterwards, some irritating substance found its way into the conjunctival sac, and that this *together with* the lowered nutrition, determined the unfavorable course of the conjunctivitis. This view of associated causes is substantially the same as that put forward by Krause, and it seems reasonable to suppose that it is the correct one.

Of all the possible trophic lesions in trigeminal neuralgia this is, of course, the most important; but another like condition is not infrequently observed, namely, herpes, and usually of the upper lip in cases of infra-orbital neuralgia. Herpes is, of course, a characteristic eruption, due in every case to involvement of nerves; and in this instance again the most reasonable assumption is that certain pathogenic cocci are unable to grow in the hair-follicles except as a consequence of the impairment of the nerve nutrition of the part.

Another instance, and also a microbic growth, is almost invariably seen in the case of the mucous membrane of the tongue, which is liberally covered with fur on the affected side.

Increase of secretion.—A phenomenon closely associated with the foregoing is invariably seen in the genuine trigeminal neuralgia, and is strikingly absent, so far as my experience goes to show, in the functional variety, and that is increase of secretory activity of the glands of the area of skin supplied by the fifth nerve, these being the sweat-glands of the skin, and the lachrymal and salivary glands of the mucous membrane. The secretion

is marked during the paroxysm of pain, and is essentially, therefore, an instance of either direct or reflex excitation of the nerve secretory apparatus. The flow of tears is partly aided by the spasmodic contractions of the orbicularis muscle, which the patient reflexly makes during the attack. The flow of saliva is an unfortunate accident, because its accumulation within the mouth obliges the patient to swallow, which act brings on a paroxysm of pain. The result is the patients frequently avoid swallowing, and hold the head forward, so that the saliva dribbles from the corner of the mouth.

Differential diagnosis.—As regards the precise determination of these cases, there are fortunately practically but two conditions which might be confused with trigeminal neuralgia, and as a consequence lead to a serious mistake. The first of these is pseudo-trigeminal neuralgia, the so-called hysterical form ; and the second is an intra-cranial growth.

First, pseudo-trigeminal neuralgia. I can most quickly contrast this with the real condition by placing the prominent characteristics of the two states in the following table, and I think if the comparisons contained therein are closely followed no mistake need be made.

Real Trigeminal Neuralgia.	Pseudo-Trigeminal Neuralgia.
Patient rarely young, usually beyond middle life.	Patient almost invariably young.
Disease strictly unilateral and constant in seat.	Very variable in seat, and rarely unilateral.
Pain very markedly paroxysmal.	Pain severe for long periods together.
Vaso-motor and trophic disturbances common.	Vaso motor and trophic disturbances absent.
Neurasthenic symptoms very moderately marked.	Neurasthenic condition is source of complaint, and strongly marked.

A word of caution may be added as regards pseudo-neuralgia, which is that the patient of course undoubtedly suffers great pain. The pain is actual enough to him or her, although it does not depend on any neuritis so far as we know, and

it can, of course, be relieved by the proper treatment of neurasthenia, namely, by strictly carrying out the Weir-Mitchell method of treatment, the principles of which may be summed up in three words—isolation, overfeeding, and massage.

The second condition for differential determination is the intra-cranial involvement of the fifth nerve by a new growth. As a rule such growths, apparently causing trigeminal neuralgia, are situated in the bottom of the temporal fossa, and are therefore liable to infect the pterygoid region fairly early. Under these circumstances the fulness in this part soon makes the nature of the case clear ; but if the tumour be restricted to the cranial cavity, then we may have to wait for the classical symptoms of headache, vomiting, and optic neuritis before a definite conclusion can be made as to the actual existence of intra-cranial tumour in a suspicious case.

As regards the conductivity of the nerve, however, there is in such circumstances a very sharp contrast with trigeminal neuralgia : in intra-cranial involvement of the nerve there is usually an early affection of sensation, so that the characteristic feature is that of neurasthenia combined with hyperæsthesia, and later anæsthesia ; whereas in the true trigeminal neuralgia, as already stated, there is little neurasthenia and no anæsthesia.

Treatment.—Before speaking of the details of the surgical treatment of trigeminal neuralgia I should like to say a few words on the previous treatment which such patients undergo before they are referred to the surgeon.

The first of these preliminary remarks has to do with the oft-recurring question of the removal of the teeth. In a paper I read before the Odontological Society some years ago I drew attention to the very unnecessary disadvantage that those patients were commonly placed in by the empirical removal of their teeth, the pain being so constantly referred to the alveolar border of the jaw, whereas of course the main part of the nerve is affected. This has no reference naturally to those cases where diseased teeth have set up osteitis of the jaw, and where it is absolutely essential that all the diseased teeth and stumps should be removed. I am only now referring to normal teeth, which ought never to be removed. Moreover, since I have shown before that conversely, removal of the nerve trunks does not affect the condition of the teeth,

supposing them to be initially healthy, and considering that the superficial operation gives the patient little or no inconvenience, certainly not so much as extraction of the teeth, it clearly ought to take precedence of such extraction, which unfortunately, however, is usually resorted to, and the patient loses his teeth without being in the least degree benefited thereby, but, on the contrary, by the loss of mastication his health is seriously impaired.

Having heard the medical histories of many of these cases, I am quite convinced that no drug has any real effect upon the condition except gelseminum, and that little or none unless it is given in toxic doses. It is a paralysing drug, and until it is given in such doses as about a drachm every two hours, and until it produces a sensation of sickness, and numbness in the extremities of the fingers, the patient is not relieved ; but when this point has been arrived at, undoubtedly the mischief is often arrested. In many cases the warning symptoms just mentioned are undoubtedly, to a certain extent, symptoms indicating danger, but they occur so early that they give ample time for the drug to be then omitted. In any case, however, it is only a temporary relief. So also is another favourite remedy, namely, the constant current. In a very large percentage of cases, perhaps the large majority of cases, this distinctly does harm, increasing the pain ; but in other cases, which cannot be determined beforehand, it undoubtedly does good, and therefore I always urge its being tried empirically before any operation is actually undertaken. A striking case which we had in the hospital is one I may refer to in connection with this point. The patient was sent to me for operation, but the constant current was tried, and in three weeks he left the hospital apparently cured. Similar cases have been published from time to time by physicians chiefly concerned with electrical work. Some of these cases naturally may have been functional, belonging to the classes of pseudo-neuralgias. Dr. Neale has strongly urged the production of analgesia by the use of the " percuteur," but in cases of real trigeminal neuralgia in which I have tried it, it has aggravated the pain considerably.

Object of operation.—After what has been said before, it follows that the object of operative treatment should be to remove the nerve trunk that is affected by the neuritis. Under those circumstances it is obvious that the operation can be divided into two kinds, minor and major ; though since it is desirable to divide the nerve and remove it, it is premature to regard any operation as definitely removing the whole nerve, unless the section of the nerve is effected on the cerebral side of the Gasserian ganglion. Practically cases arise from time to time in which the disease is apparently strictly localised to one branch ; *e.g.* quite recently I have removed the inferior dental nerve by the old operation I advised in 1892, through the sigmoid notch, in a case where only that one branch could be found to be affected, doing this avowedly as a measure which may have to be completed some years hence by the intracranial section of the nerve,—that is, presuming other branches may become affected. So, too, as regards the middle division of the fifth nerve,— the infra-orbital. If it can be shown that the infra-orbital nerve and the area supplied by its two branches, viz. the anterior dental and temporal respectively, are alone affected, then it should be removed, not by the operation that is at present to be found in most of the text-books, but by the following, which I consider is simpler and better.

1. Minor Operation.—An incision an inch long is made along the lower border of the orbit, and the periosteum of the floor raised ; the whole of the contents of the orbit being drawn up, the nerve is exposed by breaking through the roof of the infra-orbital canal, and followed back to the spheno-maxillary fossa, *i. e.* to the foramen rotundum. The structures of the cheek are next drawn downwards at the lower border of the incision, and the branches of the nerve, as it divides after leaving the infra-orbital foramen, are followed into and separated from the cheek. It will now be found possible to raise the trunk of the nerve in the floor of the orbit, and by pulling on it steadily to draw it through the foramen from without inwards, and then by the insertion deeply of forceps, after the method of Thiersch, into the spheno-maxillary fossa to detach it at the foramen rotundum. This minor operation through such a small incision gives highly satisfactory results where the disease is limited as above stated ; and since the wound heals rapidly by first intention, and leaves little or no mark, it may be properly performed as a minor procedure first.

Finally, among the minor or superficial operations of this kind must be mentioned the removal of the supra-orbital division, which is similarly effected by a half-inch incision along the eyebrow opposite the notch or foramen, and the first division, or rather supra-orbital branch thereof, is followed deeply along the roof of the orbit, and removed by Thiersch's method of avulsion.

In speaking of minor or superficial operations I specially do not allude to nerve-stretching or simple neurotomy, *i. e.* nerve section, because I do not think that those operations are any longer justifiable, the relief afforded by them being so exceedingly temporary.*

It is to be noted that in all cases of the superficial minor operation the patient may for a day or two complain of some spasms, or even of the original pain. I think that I have observed this in those cases where degenerative endarteritis was specially present, and it has certainly been most marked where oozing has taken place into the wound, which would cause pressure on the stump of the divided nerve and irritation of its fibres. Such occurrence of pain, however, disappears within two or three days of the operation.

This is the place in which to refer to the occurrence of pain after such operations, and consequently failure of treatment. The original observations of Hüter showed that the regeneration of afferent nerves occurs much more readily than is believed, and he suggested that excision of even large pieces would be followed by reunion. I am convinced now from observation of the recovery of sensation in the previously completely anæsthetic parts, as well as in one case where I obtained post-mortem examination years afterwards, that the occurrence of pain is due to the reunion of the trunk nerve in the majority of cases, but of course in other cases it is due, as before said, to the spread of the neuritis in the stump of the nerve upwards (see Weir Mitchell, 'Injuries and Diseases of Nerves').

2. Major Operation.—I will now deal in the closing part of these lectures with the complete operation for the removal of trigeminal neuralgia. In 1891, after consideration of the whole question

in a very severe case, I determined to divide the nerve-roots behind the ganglion, having already shown that it was practically impossible to remove the whole ganglion without incurring risk of rupturing the outer wall of the cavernous sinus. To attain this object (post-ganglionic section) I endeavoured in one case to raise the temporo-sphenoidal lobe, and succeeded without much trouble in detaching the sensory root of the fifth nerve from the pons, but the patient, who was in a very feeble condition, succumbed a few hours later from the shock.

In the following year there appeared a very valuable paper by Fedor Krause, of Altona (' Verhandlung der Deutschen Gesellsch. f. Chirurg.,' 1892), in which he designed and successfully carried out the operation of exposing the Gasserian ganglion in the cavum Meckelii, which he opened, and was able thereby to remove the major portion of the Gasserian ganglion and the sensory root. In his second paper (' Verhandlung der Deutschen Gesellsch. f. Chirurg.,' 1895, p. 144) he communicates in fuller detail his method, and figures the portions of the Gasserian ganglion and sensory root removed. Intermedially between these two publications he added one in the ' Deutsch. Med. Wochenschrift.,' 1893, No. 15 ; he proposed the removal of the ganglion. At the same time Hartley, in America, proposed a very similar operation, and carried it out independently.

In his complete work on the subject (' Die Neuralgie des Trigeminus,' 1896) he describes the details of the operation in a highly practical manner, and in the following description of the procedure as I have performed it I have followed his indications with certain modifications. For instance, whereas he uses the Wagner osteoplastic flap for closing the opening in the skull, I have, in consequence of my observations that there is intracranial tension in these cases, purposely not replaced the bone. Inasmuch as a thick fibrous cicatrix closes the opening, I have seen no reason to restore the original wall, and believe such a restoration to be not actually advantageous. So, too, I think it is unnecessary to ligature the middle meningeal artery (*vide infra*).

The following, therefore, is my method of doing the Krause-Hartley operation. The patient being under the influence of chloroform, a semicircular

* In the case just quoted from Bell the relief is stated to have been permanent, and doubtless this may be so in a certain proportion ; but I have never seen such a fortunate termination to a case, and in a few of the cases referred to me for treatment neurotomy has already been done.

incision is made, the lower ends of which correspond with the ends of the zygoma, while the upper part of the convexity reaches almost to the superior temporal ridge.   The skull is then
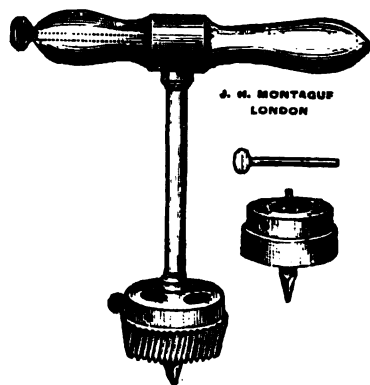
opened with a trephine through the squamous portion of the temporal, and the opening enlarged with forceps until the lower and anterior third of the temporo-sphenoidal lobe covered with dura mater has been laid bare down to the level of the upper border of the zygoma.   All this can be effected without any noteworthy loss of blood by clamping any vessel that may be divided.   The dura mater

is then detached from the whole of the floor of the middle fossa of the skull, and the temporo-sphenoidal lobe contained therein pushed inwards by means of a broad copper retractor.   In doing this it may be found that blood comes from two vessels : (*a*) from emissary veins leaving the sphenoidal lobe and dura opposite the sphenoidal fissure, to anastomose therein with the orbital plexus ; (*b*) from the middle meningeal artery or one of its branches.   The blood from (*a*), which is sometimes rather free, is easily controlled by pushing a little piece of aseptic sponge up to the sphenoidal fissure, *i. e.* between the dura and the bone ; and the blood from (*b*) is easily controlled by simply tipping in the lower end of the retractor so as to kink the artery as it leaves the foramen spinosum.   The

reflection of the dura over the middle and inferior divisions of the fifth nerve, as they leave respectively the foramen rotundum and ovale, is then easily brought into view.

The next step is to open the cavum Meckelii. This is best done by carrying an incision with a small knife parallel to the anterior border of the Gasserian ganglion, *i. e.* between the second and third divisions of the nerve, and taking care to keep well forwards, so as to be well away from the reflection of the subdural sac over the temporosphenoidal lobe.   Usually it will be found that the dura is very adherent to the lower part of the ganglion, but with a little attention it can be detached, except where adhesions are present. There is always an escape of cerebro-spinal fluid from the cavity ; very often there is free oozing of venous blood, the same coming from a small vein which, leaving the cavernous sinus at the inner wall of the cavum, crosses the Gasserian ganglion, to leave by the foramen ovale to anastomose with the pterygoid plexus.   The oozing of this can be stopped by pressure with a small fragment of sponge inserted partly into the foramen ovale. The ganglion and sensory root of the nerve, provided there are no adhesions, can be easily removed as follows :—the anterior and superior borders of the ganglion having been defined with a seeker and raised by pulling up from its bed, it is then separated by dividing the inferior division, then the middle division, and finally by detachment of the superior division of the ganglion. The ganglion is then steadily drawn upon until it is found that the sensory and motor roots have become detached from the pons, and are extracted in their full length.   This is followed usually by a free flow of cerebro-spinal fluid ; the plugs are next removed, the wound irrigated, and a large drainage-tube brought out from the bottom of the wound to a point one inch above the ear, and the wound dressed so as to exclude as far as possible any contamination from the auditory meatus.

I have been personally informed by Professor Krause that he has done the operation in thirty cases with but one death.   I have myself done it in eight cases, all of which have been healed without an accident, save that in two cases the wound healed by granulation, the others by first intention.

As regards results Professor Krause's first operation was performed four years ago, and the

other cases at intermediate dates since. In neither his cases nor in mine has there been any return of pain so far.

There can be no doubt, I think, that the Krause-Hartley operation as practised now is the scientific operation for trigeminal neuralgia, and ought always to be performed at once where the disease is intractable to ordinary remedies, and where the pain affects more than one branch. There are, I believe, no real dangers in its performance. The cavernous sinus has been wounded more than once, but, I ˙believe, only from non-observance of the anatomical connection of the upper part of the ganglion with the outer wall of the sinus. There is a special risk of septic infection of the wound, partly from the somewhat forcible manipulations that the parts have to undergo, and partly from the proximity of various septic cavities, e. g. the auditory meatus ; particular care should be exercised, therefore, in the disinfection of the scalp and auditory meatus for two or three days before the operation.

[The accompanying photographs are taken from one of my patients about six weeks after operation. The black line indicates roughly the margin of the anæsthetic area. The case is referred to on page 13 in last week's issue of this Journal.]

A CLINICAL LECTURE

ON

OPTIC NEURITIS.

Delivered at the National Hospital for the Paralysed and Epileptic, Queen Square, London,

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GENTLEMEN,—The subject which I have chosen for our consideration to-day is optic neuritis, especially in connection with the affections of the central nervous system. I shall confine myself to that form of optic neuritis capable of being diagnosed by the ophthalmoscope, and discriminated by the term *papillitis*, where the optic disc or papilla is concerned in the inflammation.

Before considering the pathological changes that the ophthalmoscope shows in the optic disc, you must to some extent be familiar with the normal appearances of the end of the nerve, and you should take early and frequent opportunities of examining the disc in healthy eyes, as a preliminary to all ophthalmological clinical work of this character.

The normal optic disc is generally round-oval in shape. Its edges are clearly defined, although not strikingly so ; you can make them out easily by the direct method. The outer edge. is much

more sharply defined than the upper, inner, or lower edges. You will notice that somewhere near the centre of the disc, usually a little to the outer side, there is more or less of a depression, called the "physiological pit." The disc as a whole is of an orange-pink colour, and the depth of colour is least marked in the situation of the physiological pit, and towards the outer edge; that is to say, there is less colour in the outer third of the disc than in the remainder. The disc as a whole gives you the impression of slight translucency, as though you could see partly into its tissue. This appearance is no doubt due to the fact that you are seeing minute blood-vessels which are lying behind the actual surface. At the bottom of the physiological pit you frequently see a grey stippling, where the nerve-fibre bundles pass through the meshwork of the lamina cribrosa.

In optic neuritis at the intra-ocular end of the nerve you have changes in the colour, and in the appearance of the edges of the disc, changes in the condition of the physiological pit, and changes in the blood-vessels. As to colour, the first change which takes place in optic neuritis is an increased redness; there is a pathological blush of the disc itself. But far more important, and less liable to be confused with simple physiological hyperæmia, is the fact that changes take place in the edges. You will find that in optic neuritis, instead of being able to see the edges distinctly, they are more or less obscured, and this blurring soon becomes so great that you can only just make out where the margin is situated. As the papillitis increases, you find that gradually it becomes uncertain where the edge is, and often the outline is quite lost, the outer edge remaining longest in view. At last even the outer edge may become quite hidden, and very often the amount of blurring extends for some little distance outwards into the neighbouring retina. Corresponding with this blurring of the edge, you have a certain amount of indistinctness over the rest of the disc too, and it loses its translucency. The physiological pit, which in health is perfectly clean, becomes filled up by something opaque, and the lamina cribrosa is consequently no longer discernible. The retinal blood-vessels lose their normal appearance, and the relative size of arteries and veins is modified; the arteries retain their original calibre, but the veins become distended as a

result of pressure on the main trunk in the inflamed nerve end. They give themselves as much carrying power as possible by becoming broader and more tortuous. The swollen veins are also darker in colour, owing to the greater thickness of the blood column and to the retarded circulation. The blood-vessels often get partly concealed by the inflammatory exudation; they often only come into view here and there, both on the disc and in the neighbouring retina.

In advanced cases of papillitis there is a tendency to hæmorrhage from the retinal blood-vessels; these hæmorrhages may occur on the disc itself, or in the retina away from the disc. Occasionally you may find that the artery is partly obscured by the hæmorrhage, and it is of course difficult to be sure whether the extravasation is from the artery or from the vein. Practically always, however, it takes place from the engorged veins.

Last, and most important of all, the disc in optic neuritis becomes swollen. The normal papilla is on the same level as the adjoining retina, as far as the ophthalmoscope is concerned, but change in level may occur in both directions. In long-standing glaucoma, for instance, the disc is very much *depressed*, and even in optic atrophy you find a certain amount of lowering of the disc level; in papillitis, on the other hand, its level is altered by being raised. All such changes in level may be detected by a lateral movement of the ophthalmoscope mirror (or of the lens if employing the indirect method), and observing the relative rapidity of the apparent movement so produced in the vessels on the disc and those just outside it. This test indicates roughly the nature and degree of the difference in level, and is particularly useful when using the indirect method. But in the present day everybody prefers the direct method for such observations, and it is usual to measure the exact swelling of the disc in papillitis. This can readily be done by anyone who has learned to steadily relax his accommodation, or keep his accommodation steady, whether relaxed or not. A good modern ophthalmoscope must be used, provided behind its mirror with easily changed lenses numbered in dioptres. You first of all measure a part of the retina some little way from the optic disc, say two or three disc-diameters distant above or below, choosing a healthy-looking part. The measure-

ment consists in finding the highest convex or lowest concave lens with which you can clearly see the retinal blood-vessels in the chosen area. Next in a similar manner "measure" that part of the swollen papilla that can be seen clearly with the highest convex (or lowest concave) possible. The difference between these measurements of the retina and highest part of the papilla gives the difference in their levels expressed in dioptres. We will say, for example, that the retina is measured with + 1 D., and the highest point of the disc with + 6 D. ; the difference between the levels is therefore expressed by 5 D. If you want to get an idea of what five dioptres means in reference to swelling, there is a simple formula for approximately converting such measurements into millimetres, viz. that each dioptre may be reckoned as = ·3 mm. ; thus in our hypothetical case the difference in level = 5 D. = 1·5 mm. This is not an unusual degree of swelling in papillitis, and if you consider the actual size of the disc itself (1·5 mm.) you will realise that this swelling of the disc means *an increase in height equal to its original breadth.*

Of all the characters of papillitis that I have mentioned, the least important is colour, and the most important is swelling. The least important is colour, because discs vary very much in colour in the physiological range, just as persons differ very much in the colour of their cheeks. Infants always have pale discs ; children above three have commonly translucent, high-coloured discs ; old people, again, have comparatively pale discs. Furthermore, the discs are liable to a transient hyperæmia from many physiological causes, *e. g.* after prolonged close work and exposure to bright light. Colour in papillitis, however, goes for something, especially if you compare the colour of the discs in the two eyes, because if the colour of one differs much from that of the other you will have distinct ground for assuming that there is some pathological change in one of them. As the papillitis increases the redness tends to diminish, partly because the surface of the papilla is covered by inflammatory products, partly because the arteries themselves are now subjected to some degree of pressure, and their blood-current consequently diminished.

Blurring of the edge is a more important symptom, but this may be present in high hypermetropia, and exist for years without there being any evidence of pathological change or any loss of function.

The condition of the physiological pit is exceedingly important, because it furnishes one of the most accurate means of distinguishing between an hypermetropic peculiarity and a pathological change. While in hypermetropia you may get loss of contour and exceptional redness of the papilla, you never get the physiological pit "filled in," as it is in papillitis. In hypermetropia, although the blood-vessels, both arteries and veins, are often tortuous, the veins are not dark and distended, and there is no liability to hæmorrhage. A very important difference is that you rarely meet with elevation of the papilla in connection with a mere hypermetropia.

A few words in regard to the causation of the different appearances. The increased redness is due to extra vascularity associated with the inflammatory process—distension of the small vessels, and the formation of new vessels and capillaries in the papilla itself. It is also increased by the fact that, on account of the venous congestion, the colour of the blood may be darker than normal.

The blurring of the edges of the disc, and the swelling, are manifestly due to some changes that take place in the tissues. Normally we have here a large number of bundles of axis-cylinders, collected from all the retinal surface, passing into the nerve-trunk ; these lie in a delicate connective tissue, and are surrounded by a fine capillary plexus ; on the surface of the disc the large central vessels are placed. Mere distension of the capillaries will cause a certain amount of swelling of the tissue. Secondarily this is followed by escape of serum and consequent œdema of the papilla. The white cells wander into the tissue, the red corpuscles are often extravasated, and there is an engorgement with inflammatory products ; the general swelling is thus increased. These inflammatory deposits often occur, particularly in patches on the disc or neighbouring retina. Lastly, we may mention fine changes in the connective tissue and in the nerve-fibres, though these do not add greatly to the swelling. The filling-in of the physiological pit is due to the occurrence of inflammatory exudation.

As regards the blood-vessels, I have said that there is practically no change in the arteries in

papillitis. If you look at a case of optic neuritis, however, you will often find that an artery only appears at intervals, being obscured during the rest of its course, or it may come into view only in part of its breadth. The artery, normally, does not take a straight course, or preserve the same level in the thickness of the retina, arching sometimes against the inner surface, sometimes dipping down deeply under the nerve-fibres. Consequently, if there is much inflammatory exudation, the part of the artery that lies deepest in the retina is concealed. Sometimes the red spot or streak, corresponding to the unhidden part of an artery, is liable to be mistaken for hæmorrhage.

A retinal vein, on the other hand, is very rarely obscured to any great extent; generally speaking, it can be seen throughout its course. The veins are not concealed much because they, instead of having comparatively stiff coats and a determined position in the retina like the arteries, have exceedingly fine sheaths, and more readily alter their curvatures, so that they are readily raised or floated up by any exudation into the surrounding retinal tissue. Their larger size and darker hue also aid in their being more easily seen. They are consequently particularly serviceable in all measurements of level of the surface of the papilla and retina at different points.

What is the ætiology of optic neuritis? We know that it may occur with meningitis and with tumour in any part of the intra-cranial cavity, and occasionally it may be associated with myelitis. We also recognise it as a symptom which occurs in some general diseases, such as renal disease and well-marked anæmia, as well as in connection with certain forms of poisoning. But to-day we have to consider its connection with diseases of the central nervous system only.

I may say, as regards the connection between optic neuritis and acute myelitis, that the association is very rare and difficult of explanation when it does occur. Of course it is perfectly open for pathologists to say, as they have said, that the process travels, by way of the meninges, along the base of the skull, and gets to the chiasma, and that then the optic nerves themselves are involved, and the papillitis follows. But until someone proves that the meninges are invariably affected in all this course we must fail to grasp the universal application of this explanation. It is probable, as Gowers

has pointed out, that occasionally the optic nerves and spinal cord are inflamed from one general cause, just as they are liable to undergo chronic atrophic processes from the action of one disease.

If you consult different authorities on the nature of the connection of optic neuritis with intra-cranial affections, you will find a good deal of diversity of opinion. That optic neuritis is a common affection in intra-cranial disease makes its recognition of great importance to the physician, but it does not give definite information as to the nature or localisation of the disease. For example, it is nearly always double, yet, exceptionally, one-eyed optic neuritis has been observed in intra-cranial cases. Not uncommonly there is a decided difference in the swelling of the two papillæ in brain tumour, and this has been accepted as indicating the probability of the growth being on, or mainly on one side. Yes, but on which side? Some believe on the side of the brain corresponding to the greater papillitis; others say on the opposite side. Cases can be produced in favour of each belief. Personally, I have much diffidence in expressing an opinion on such a point, and do not regard much the value of the observation; but I am inclined to believe that the greater swelling of disc is on the same side as a tumour situated anteriorly, on the opposite side in the case of tumour of posterior cerebrum or cerebellum. But there must necessarily be exceptions to any general rule, due to unknown differences in the readiness with which meningitis can invade each optic foramen, or in the effect that will be produced on the two nerves by intra-cranial pressure; these are unknown anatomical and pathological factors governing the result. A rapid onset of papillitis, with much swelling, is in favour of cerebral abscess, or quickly growing tumour, but it may be due to anæmia only. In short, we must not expect too definite information from the ophthalmoscope alone. We, however, know certain facts. First of all, in meningitis, it is most common and best marked when the base of the brain is affected. Secondly, it is common in association with all intra-ocular growths, particularly with the rapidly growing tumours of vascular character. As regards position, a tumour of the convexity in the motor area is less liable to cause optic neuritis than one situated in other parts of the brain. Cerebellar tumours cause frequently gross papillitis, with much swelling.

Pathologists have found that in optic neuritis the nerve is often inflamed right back from its intra-ocular end to the optic foramen, and that the inflammation can then be traced into the meninges at the base. I ought here to remind you of the anatomy of the optic nerve trunk. If you make a section across the optic nerve you will find that it has a thick outer sheath, loosely applied, and that it has a closely investing inner sheath, which sends numerous processes inwards, forming a fibrous framework in which the nerve-fibres lie. These sheaths are known respectively as the outer or *dural*, and the inner or *pial*, and they are continuous with the membranes of the same name in the intra-cranial cavity. The space between these sheaths is divided by a very thin membrane, which is no doubt a continuation of the arachnoid, and divides the space into two parts, known as the subdural and the subarachnoid spaces. These spaces are prolongations of those of the same name inside the skull.

Accordingly you will understand that an inflammation affecting the anterior part of the base may be readily communicated to the sheaths of the optic nerve, either by a direct extension of the inflammation along these sheaths, or by a contamination of the fluids in the spaces between them. If the pial sheath be primarily invaded, you will see how its extension into the nerve will readily convey the inflammation to the nerve itself. But in the case of the dural sheath (as, for example, when it is involved in a periostitis at the optic canal), the manner in which the nerve will be affected is not quite so direct. In this case the subdural space will be first invaded, and the subarachnoid will follow, for the membrane between is imperfect. The pial sheath will be later affected, either directly from the morbific material in the surrounding space, or by this material being conveyed around vessels that enter this sheath from without, *e. g.* along the central vessels and posterior ciliary arteries.

We know that in many cases of optic neuritis there is a great distension of the sheath space immediately at its ocular end, and that this is filled with fluid. No doubt this is on account of the communication between it and the corresponding space in the intra-cranial cavity. Whether it be that the intra-cranial pressure produced by tumour is transmitted through the optic canal, and thus interferes with the normal backward flow of lymph from the optic nerve and eyeball, and so causes this distension; or whether it is that the tumour is associated with an extra amount of fluid being developed primarily in the intra-cranial cavity, and this fluid being driven into the sheath space causes the distension, we cannot affirm, but we take for granted that the latter is the more plausible explanation. Possibly both causes may be often operative simultaneously. An anterior basal meningitis, by closing wholly or in part the sheath space at the optic foramen, would prevent fluid from passing backwards, and the consequence would be distension of the sheath, and a tendency to œdema of the papilla, revealed ophthalmoscopically by swelling.

The time that optic neuritis takes to develop varies very much. Often in meningitis, and especially with a rapidly growing intra-cranial tumour, it comes on quickly, and in a week the swelling of the papilla may amount to several dioptres. In other cases it progresses insidiously at first, and may increase very slowly for months. In cases of great swelling the attempt has been made to get rid of the fluid in the distended sheath by puncturing it behind the globe, but no good result has ever been proved to be due to this procedure. In the first place, optic neuritis frequently subsides comparatively rapidly under general treatment. Secondly, you can only remove the fluid temporarily, and it will return in as large a quantity as before if the cause be still operative. Further, it is by no means certain that distension of the sheath always accompanies swelling of the papilla, and there is no evidence to prove that the distension is in itself hurtful.

Optic neuritis, moreover, may exist for weeks without there being any defect of vision. I have even known papillitis persist for over two years without vision being impaired, but this is very exceptional. The longer the papillitis exists without vision being affected, the stronger the evidence that in this particular instance the swelling is chiefly due to œdema, and not to an inflammation associated with much exudation or other changes liable to lead to ultimate atrophy. The sooner vision is affected the more likely on the whole is the neuritis to lead to ultimate strangulation. But the mere fact of vision being affected does not prove that the case will progressively get worse.

What is not uncommon is that a patient comes here with intra-cranial symptoms—great pain in the head, vomiting, and double optic neuritis, with considerable swelling, and some early impairment of vision. There is a history of syphilis; he is put upon the ordinary treatment for this disease; all his symptoms subside. So that by knowing the cause of the optic neuritis, you may have a favorable result in an otherwise apparently unfavorable case. I have seen such a papillitis with a high degree of swelling, and yet the whole has subsided so that ultimately no trace of the former neuritis remained, and the vision remained perfectly normal. Marked improvement in the condition of the papilla often follows the operation of trephining the skull. It is presumably the reduction of intra-cranial pressure, in any way induced, that leads to diminution of swelling in such cases, but I do not say that this reduces the actual neuritis.

When an acute optic neuritis has lasted for a certain time, you generally find the nerve undergoing certain alterations in appearance, and the manner in which these changes occur is of value in your prognosis. If the swelling fairly rapidly diminishes, with little or no change in the redness at first, the indications are those of a healthy subsidence. If, on the contrary, the swelling persists or alters slowly, while the redness quickly diminishes, the probability of subsequent atrophy is very great. But these changes of subsidence, and the character of the atrophy resulting, I shall consider more at length in my next lecture. Bear in mind, however, that visual changes occurring early in optic neuritis are compatible with a good result, while those occurring in the stage of subsidence practically always mean permanent impairment of sight, and often complete blindness.

Artificial Anus after Colotomy.

—Beyer so plans his incision through the belly walls that the cut through the peritoneum lies parallal to the skin incision, but one and a half inches upward and inward from it; thus the opening is oblique. The sigmoid flexure is drawn out and secured to the parietal peritoneum, then to the borders of the abdominal muscles, after which the greater portion of the skin wound is closed. The remaining portion of the gut is then drawn forward, opened, cleansed, and secured to the skin edges.—*Prag. med. Woch.*, No. 8, 1897.

REMARKS ON APPENDICITIS.

A Clinical Lecture delivered by

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GENTLEMEN,—The patient that I am about to operate on this morning before you is a lad of 19 years, and who presents the following history, which I shall briefly give you.

During the month of June, 1896, I saw the patient, whom I found to be suffering with a most typical attack of appendicitis. The temperature was 39·5° C., and the general condition and look of the patient decidedly pointed to a condition of sepsis. Upon questioning him at that time I found that he had been constipated for about six months, and that an attack of pain in the iliac region had come on the night before very suddenly, being ushered in by chilly sensations and a sentiment of general malaise. There was great tenderness in the region of the so-called McBurney's point, and on account of the surroundings of the patient I sent him to the hospital.

As I was just about to go on my holiday I did not see the patient until my return to the city in October, at which time he told me that while in the hospital he was not operated upon, and that he left after a stay of about three weeks feeling fairly well.

But since leaving the hospital, and on this point I wish to insist, he tells me that he has not been free from a heavy, dragging sensation in the right iliac fossa, and occasionally when he goes to bed at night he has a little pain. He still continues to be constipated, and can only have a movement from his bowels when he takes medicine.

Now, gentlemen, you will ask why I have decided to operate on this patient, and I will tell you. In the first place, he has had marked symptoms of acute appendicitis, and since this time, and although he has fairly well recovered from the attack, he has *not been free from a disagreeable*

feeling, as I have already pointed out, *in his right flank*, and I take it for granted that there is a chronic process going on in the peritoneal cavity, which will sooner or later result in another attack in the appendix; and consequently I have advised him to have the offending organ removed now, because he is entirely free from fever or any septic condition; and it is the proper thing to remove the appendix, when possible, during the quiet interval between the attacks.

In this case no abscess is probably present, nor a collection of any sort, because I have carefully examined the patient under ether, and neither abdominal palpation nor examination per rectum shows the slightest trace of any inflammatory exudation.

Nevertheless the condition in which this patient is in clearly points to what French writers have so cleverly called " Peritonism;" that is to say, a low grade of inflammation of the peritoneum, which from any slight cause may suddenly light up into an acute inflammation of the serous membrane of the abdominal cavity.

Before operating on this case I should, however, like to detain you for a few moments to discuss a few points regarding the localisation of the appendix, as well as to point out to you some of the places in which abscess due to an appendicitis may be found.

The cæcum is situated in the right iliac fossa, which it almost completely fills, and the organ is entirely surrounded by the peritoneum. It is also perfectly free, and usually you can insert your hand and pass it entirely around it. Its arrangement, which was for a long time misunderstood, is now perfectly demonstrated.

Only infrequently the peritoneum forms a meso-cæcum behind the cæcum, which binds it down in the iliac fossa, and very infrequently the peritoneum only covers the anterior aspect, while the posterior aspect of the organ is in direct contact with the cellular tissue of the iliac fossa; according to Testu, it may be said in principal that in the adult the cæcum is more or less adherent in one subject out of every ten, while it is free and floating in the remaining nine.

The vermiform appendix arises from the internal or posterior internal aspect of the cæcum at the junction of the upper two-thirds with the lower third of the organ.

According to Clado, its relation to the abdominal wall would correspond to the intersection of a perpendicular line, carried from the anterior and superior iliac spine, or slightly below this, with another line carried from the external border of the rectus muscle on the right.

The length of the appendix is extremely variable, and I have seen it measure as much as five inches in some subjects, while in others it would not be more than two. It is sometimes very irregular in shape, being undulated; at other times quite straight; some will be perfectly straight until within about a half an inch of their extremity, when they will be bent over in the form of a hook. The calibre of the appendix is also extremely variable in one subject from another. According to Ferguson, the organ was found nineteen times on the external aspect on the right side of the cæcum, eleven times it was directed straight downwards, eighteen times inwardly, seventy-five times it was in direct relation with the posterior wall of the cæcum, and in seventy-seven subjects it was placed in such a manner that its perforation would certainly have occurred in the subperitoneal tissue, and would certainly have produced an abscess in the iliac region. I have myself found the appendix situated under the liver in two autopsies which I made, and in which no trace of inflammatory lesions could be found in the abdominal organs. According to Lafforgue, the general direction of the organ is descending; sometimes it reaches the pelvis, a condition which Clado considers as the most frequent; and when in this situation it is in relation with the organs contained in the pelvic cavity, namely, the rectum, uterus, ovary, and bladder. According to the first-mentioned writer, it is directed towards the abdominal cavity in about 19 per cent. of cases, and towards the coils of the small intestine, and in about 13 per cent. it is directed upwards, and lies against the posterior aspect of the cæcum and of the colon, and may extend as high as the kidney, or even to the liver and gall-bladder; in some few cases it may be directed outwards, and is then lying against that part of the fascia iliaca which covers the iliac muscle.

The position of the appendix is always dependent on that of the cæcum. In the fœtus it is wound around the postero-inferior aspect of the latter organ, and falls down into the iliac fossa not far,

from it.   The organ occupies this fossa, in which it may be found occasionally in the adult, sometimes its lower part is slightly lower.

There have been other principal forms of positions described, and they are as follows :—First, the external iliac position, in which case the appendix occupies the right iliac fossa outside of the external border of the psoas, and lies directly on the fascia iliaca, or the external border of the cæcum. Second, median iliac position, in which the organ is situated more inwardly, and lies on the psoas muscle itself, and may often be in contact with the vertebral column.   The third position is the pelvic, in which the appendix is found in the pelvic cavity at the level of the superior strait, and descends in this cavity along the external border of the sacrum, and sometimes even in the middle region.

Between these three types are intermediary ones.

According to Talamon we have four principal varieties of abscess of the appendix.   When the appendix is directed straight downwards, free or adherent to the posterior wall of the iliac fossa, its perforation will give place to an iliac abscess, and the pus will accumulate above the arcade of Fallopius.   It may be intra-peritoneal, intra- and extra-peritoneal, or simply extra-peritoneal, if the organ is not entirely covered, or if it has perforated between the folds of the mesentery, which keep it down against the iliac fossa.

When the appendix is found in the pelvis the abscess is formed at the internal part of the iliac fossa, and the pus tends to accumulate in the pelvis, between the rectum and the bladder, or between the vagina and the rectum.   When it is directed upwards and inwards the pus collects near the umbilicus, above and inwardly to the iliac fossa, and the opening of the abscess may occur through the umbilicus itself. When the appendix is directed outwards and behind the cæcum the pus collects around the latter, and produces a tumour in the costo-iliac space or in the lumbar region.   The walling off of the abscess from the general peritoneal cavity occurs very easily, and probably on account of the thickness of the abdominal walls it does not perforate them, and becomes diffused either towards the iliac fossa or towards the lower aspect of the liver, and may produce a right-sided purulent pleurisy ; and lastly it may open either into the cæcum or the colon.

Gerster gives the following classification of these abscesses :—first, the ilio-inguinal type, which is the most frequent ; secondly, the anterior type, in which the pus collects very high up towards the umbilicus ; thirdly, the posterior type, which is detected by a swelling above the crest of the ilium ; fourth, the rectal type ; fifthly, the meso-cœliac type, in which the pus collects in the midst of the intestinal coils, without connection with the anterior or posterior abdominal wall.

In the way of very infrequent localisations the appendix has been seen to become inflamed and perforated in the sac of a hernia, as well as in the scrotum.

A sub-umbilical abscess may be intra- or extra-peritoneal.   The intra-peritoneal form may be only seated in the hypogastric region, and the partial fibrino-plastic peritonitis which occurs as soon as there is an appendicitis, and which has for effect to limit the disease to the shape of the tissues, closes the point of the appendix in a position and in regions which are perfectly abnormal.

As we have seen, the direction and the position of the appendix are very variable, and when it is free in the abdominal cavity the initial inflammatory attack may bind it down in places where we would hardly expect to meet with it, such as the rectum, the vagina, bladder, against the anterior abdominal wall, in the neighbourhood of the umbilicus, or, as I have pointed out to you, on the inferior aspect of the liver.

Schwartz has reported a case in which an incision was carried along the median line below the umbilicus, and after going through layer by layer a cicatricial tissue which followed the linea alba, he opened the peritoneum, which was adherent to a certain number of mesenteric folds, which he was obliged to break up in order to enter the abdominal cavity.   By directing his fingers outward and downwards along the border of the incision he felt a rounded cord, which, starting from the iliac fossa, became adherent to the abdominal wall ; this cord was drawn outwards, and it was found to be the appendix, whose free extremity had become intimately united with the abdominal wall.

In other cases the appendix will be found in its place, and there is at the same time a hypogastric collection and an ilio-inguinal collection, which are connected by a more or less narrow tract.   According to Charpy, the space comprised between the

recti muscles and the peritoneum is divided by the prevesical layer into two spaces ; the anterior one being the prevesical cavity, while the posterior he calls the subperitoneal or pre-ouracal cavity. The prevesical cavity is a triangular space which extends from the umbilicus to the floor of the pelvis, and is prolonged in the form of a cul-de-sac along the prostate and the rectum as far as the sciatic spine. It contains less connective tissue, and at no point communicates directly with the subperitoneal tissue. The subperitoneal space is comprised between the peritoneum and the prevesical layer, and is not in absolute continuity with its cellular tissue and that which lines the serous membrane in general, because the prevesical fascia adheres by its borders to the peritoneum and to the aponeurosis which partially closes up this space. Outwardly the peritoneum adheres nearly directly to the muscular aponeurosis. In the pelvis the subperitoneal space continues quite freely with the cellular tissue of the pelvic floor, that of the broad ligaments, and the iliac fossæ. In the centre will be found the bladder, surrounded by cellular tissue, which becomes thinner as it extends backwards.

According to Charpy, a suppurating appendicitis may be situated either in the perivesical cavity or in the subperitoneal or prevesical cavity. The perivesical abscess is rounded and situated in the middle line ; it is deep, retro-parietal, and may extend along the pelvic walls as far as the sides of the rectum, but not behind the bladder, nor in the ischio-rectal fossa.

A perivesical or subperitoneal abscess has a globular form, because the bladder is surrounded by an inflammatory mass. Sometimes the remains of an extension of this inflammatory mass will be found going to the umbilicus along the urachus. This abscess extends backwards, but does not come in contact with the symphysis, and its walls may be felt above the prostate or in the anterior cul-de-sac of the vagina. The suppuration does not always respect the aponeurosis, and the abscess may invade the sheath of the rectus muscle, the prevesical and the perivesical space, and a certain extent of the peritoneal cavity. An abscess may also be situated in the subumbilical space, and is thus made up :—in front, the posterior sheath of the rectus muscle ; behind, in the midst of the prevesical fascia, on the sides of the peritoneum ;

latterly, adhesion between the peritoneum to the sheaths of the recti muscles and above the umbilical cicatrix, while below there is no tumefaction.

(*To be continued.*)

NOTES.

The Indigestion of Breast-fed Babies.—It is stated in the ' Archives of Pediatrics,' that for many reasons less attention has been paid to the gastro-intestinal affections met with in breast babies than in those nursed artificially. Breast milk is the natural and ought to be the sole food of the infant, under physiological conditions, during the first year of life. Unfortunately, there is too often a departure from the normal state, and the child, perhaps also the mother, may suffer during the lactating period. The natural pride and instinct of the mother are apt to lead to the presumption that all is going well with her and the infant, when in reality she is not a good nurse, and the child is suffering more or less. In America the question of infant-feeding in all its aspects has received the attention which it deserves, and which it has not met with in England. The greater prevalence of diarrhœal disease during the tropical summer of the American continent has stimulated study and research on this important subject. Milk laboratories have been established in the larger cities, and the feeding of infants has been placed on a comparatively sure and scientific footing. Owing to the researches of such men as Jacobi, Rotch, Holt, Lewis Smith, Meigs, and others, we are now furnished with scientific data to guide us in the study of the subject. In the writer's own country the question of milk supply is now receiving some attention from sanitarians, but there is as yet no ready means available to the general public of obtaining pure or properly sterilised milk in quantity, nor of having milk analysed or tested in laboratories established for the purpose. Whenever the milk of the mother is defective in quantity or quality, the child is apt to suffer. It does not thrive or grow at the normal rate. Instead of being plump and firm and happy, it is soft and flabby, and is always crying, and never appears to be satisfied. Its skin is harsh and dry.

The tongue is somewhat red, often slightly furred. Vomiting from gastric catarrh is not infrequent. The stools are unnatural, and present various appearances depending on the quality of the milk. They are generally loose, and seldom have the natural mustard colour or consistence; but are usually pale, and often of an ashy grey colour, sometimes greenish, or mixed grey and green. The soft curd of the mother's milk is present undigested in little granular-looking masses. There is an excess of mucous secretion; sometimes there are little streaks of blood. As a rule, indigestion of mother's milk is more frequently intestinal than gastric, diarrhœa being more common than vomiting. This appears to be largely due to indigestion of the fatty and proteid elements of the milk. Infants, in regard to their digestive capabilities, are but little men and women, and it is certain they have their idiosyncrasies likewise. The milk of a mother seems to be suited to her own child under physiological conditions. Irregular suckling is one of the commonest causes of indigestion in babies. It produces a milk too concentrated, which inevitably causes indigestion in the child. Regulation of the suckling is generally sufficient to give relief. Irregular suckling may be due to two principal causes. It may occur in cases in which the milk is normal in quantity and quality, from bad habit on the part of the mother in being over anxious about her child, and carelessly giving it the breast at irregular times or whenever it cries. The more frequent cause, however, is deficient quantity of milk. In this case the child is unsatisfied and gets the breast too frequently in consequence, with the result that the milk becomes too concentrated and causes indigestion. The remedy is the addition of some substitute feeding. Inseparably connected with the question of maternal feeding is the no less important one of the artificial rearing of infants who are unable to obtain breast milk. The huge mortality of infants under one year is hardly reduced to a lower level than it was half a century ago, when in England and Wales no less than 76,328 children under twelve months died, out of a total of 350,101 deaths in one year. Want of breast milk and bad artificial feeding are largely responsible for this. Surely it is our duty, as a profession, to try and stem this tide of mortality. There is no

way to attain this end but by education; and let us hope in the near future that we will be in a better position in this respect, and have greater facilities for showing good results in what, it must be admitted, is an important branch of preventive medicine, too much neglected.—*Medical Record*, October 16th, 1897.

Sulphonal as an Antisudorific in Phthisis.

—Combemale and Deschecmocker ('La Méd. Mod.,' September 11th, 1897) have obtained very good results from the use of sulphonal in the night sweats of phthisis. In one patient the sweats disappeared after three doses, while in others they became limited to a portion of the body, usually the head, and in others, though remaining general, lost a severe character. In most of the patients to whom the remedy was administered there was a persistent action for a number of days after its use was interrupted. No serious symptom attended its employment. In one instance there was a mild intoxication following a two-weeks' exhibition of the drug, which disappeared when it was discontinued. The dose was generally from 15 to 30 grains at bedtime or a little before, and this was continued daily for two weeks.—*N. Y. Med. News*, October 16th, 1897.

Bone Transplantation as a Substitute for Amputation.

—Barden-Hauer (*Revue de Chirurgie*, January, 1897) has lately resorted to division and transplantation of one-half of a healthy metatarsal bone for disease and death of an adjacent bone shaft. In cases of the partial or complete destruction of one of the metacarpal or metatarsal bones, by this method he has had in several instances the most gratifying results. Twice he applied this device to exterior destruction of the lower end of the radius. He has also executed a remarkably ingenious operation for the restitution of the upper end of the humerus, by detaching the spine of the scapula from its muscular attachments, cleaving through the ridge close to its base and freeing it on either end. He then transported this segment of live bone into the gap left by the removal of the destroyed shaft. The result, as in his other cases, was successful. In young subjects the scapular spine is reproduced, care being taken to always leave the periosteal investment behind.—*Therapeutic Gazette*, October, 1897.

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* *Specially reported for The Clinical Journal. Revised by the Author.*

A CLINICAL LECTURE

ON SOME CASES OF

INJURY TO THE ULNAR NERVE.

Delivered at St. George's Hospital, by

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GENTLEMEN,—I have had under my care during this year several cases of injury to the ulnar nerve, which I think are sufficiently interesting to consider because they illustrate the conditions most commonly met with in nerves which have been subjected to injury.

The first case is that of a girl æt. 14, who came to the hospital in January last. In August, 1896, she fell and hurt her left elbow, which was said to have been dislocated; for this she was treated at another hospital. All went well so far as she knew, but upon the splints being removed she found that the arm was very much wasted and very much wanting in power. That in itself was, of course, nothing very remarkable, because it is usual to find wasting and loss of power in limbs which have been in splints for any length of time.

Instead, however, of the wasting and loss of power disappearing after the removal of the splints they increased, in spite of the application of massage and other treatment, until at length hardly any power remained in the hand at all. It was also said that for several weeks the hand had assumed a bluish look. She was therefore sent to this hospital. On admission her left hand was cold and bluish, the interossei were wasted, the fingers were in the position peculiar to interosseous palsy; there was loss of sensation over the fingers supplied by the ulnar nerve. The elbow was a little stiff, and upon examination there was found, just above the internal condyle, a spiky irregular prominence, apparently the result of fracture. Pressure on the ulnar nerve just below this prominence was very painful, the pain starting at the point of pressure and shooting down into the fingers. The direction of the shooting of the pain in these cases is an important point, as you will notice presently. It was quite clear that there were plenty of symptoms here pointing to complete or partial division of the ulnar nerve, or of its being involved in some cicatricial material in the neighbourhood of the projection of bone. Therefore on January 11th I cut down on the nerve just behind the prominence, and found the tissues greatly matted together; indeed, it was difficult to clear the nerve freely from the adhesions round about it. This was at length done, and the nerve in one situation was found to have been so compressed by the cicatricial tissue that it showed a marked constriction in its outline; there had been no division of the fibrils, the nerve being simply compressed. The only thing, therefore, indicated in the way of treatment was the separation of the nerve very freely from the matted parts, loosening it in every direction, the edges of the superficial wound being subsequently united in the ordinary way. The wound of course healed immediately, and everything went well. Twelve days after the operation the hand, instead of being cold, was quite warm, the sensation had returned, and the muscle power was very rapidly coming back; moreover pressure on the spot, originally sensitive,

now caused no pain whatever. So that you see within three weeks of the operation the patient left the hospital almost well,—that is to say, she had good sensation, a proper local temperature, and muscular power very nearly complete. That is an instance of loss of sensation, palsy, and loss of warmth in a limb from compression of the nerve by cicatricial tissue.

The next case is one of complete division of the nerve. The patient was a girl aged 24, who was admitted on February 2nd. The history she gave was that in November, 1896, she fell downstairs and cut her left elbow with a broken tumbler. The wound was sewn up by a practitioner, but nothing was done to the nerve; probably the injury to the nerve was not then recognised. The wound healed well, but great weakness followed, especially in the fourth and fifth fingers ; loss of sensation was observed, but the date of this was not noted. Within the month before admission the fingers had become flexed into the palm, and had become shiny in look, as digits supplied by nerves which have been divided do. There was a puckered scar about two inches long just above the internal condyle of the humerus. The interossei were wasted ; there was loss of power, with absence of sensation over the area of the hand supplied by the ulnar nerve. In addition to this the hand was very cold. Here again there was only one thing to do in the way of treatment, namely, to expose the nerve and see what was its condition. That accordingly was done on February 5th. I made an incision over the nerve, found it intimately mixed up in the cicatrix at the inner side of the elbow. Having after a good deal of trouble isolated the nerve very freely, it was found to have been completely divided, the upper end terminating in a bulbous enlargement ; the lower end was also slightly bulbous, the two divided ends being connected by a thin strand of connective tissue. This, therefore, was a well-marked case of complete division of the ulnar nerve. It was quite clear that this girl had no chance of recovering her lost power of sensation, &c., unless the nerve ends were reunited. The question then arose as to the proper situation at which the section of the nerve tissue should be made in order to freshen the ends for the purpose of bringing them together by suture. This is an important detail in cases of this kind. If any of you were present at the operation you

may recollect that I made the section within the limits of the bulbous enlargement,—that is to say, after I had cut away what I intended I left a portion of the bulbous enlargement, through which I passed my sutures. At first sight it might perhaps be thought that the best thing to do would be to cut away the bulbous enlargement altogether, leaving only healthy nerve tissue; but that is neither necessary nor desirable, because there are enough young nerve-fibrils in the bulbs to bring about a cure supposing the two ends are properly approximated. It is clear that, for the purpose of bringing the ends thoroughly together, the less nerve-substance removed the better. The smaller the distance between the cut nerve ends, the less will be the tension after their approximation. There is another reason for not sacrificing the whole of the bulb in these cases. The bulbous ends of divided nerves are mostly made up of fibrous tissue, which being firm and tough allows stitches passed through it to hold well. If the whole of the bulbous material is removed, and the stitches are passed through the nerve tissue only, they are very liable to cut through if there is any tension at all, failure of the operation being a necessary sequence. Within twenty-four hours of the operation this girl, who before had no feeling whatever in the fingers supplied by the ulnar nerve, had distinct return of sensation ; the fingers were warm, and she could feel a touch well. *Three days afterwards the improvement had disappeared, and she had no sensation in the affected fingers at all ;* in point of fact, excepting that the fingers were not quite so cold as before the operation, she was in the same condition as when she first came to the hospital. That at first would appear to be a rather alarming event, and in those unaccustomed to these cases it may lead to the impression either that the operation had failed, for some reason not easily explained, or that the stitches had given way and the nerve ends had become separated again. But this by no means follows in cases in which these symptoms occur. In this case sensation reappeared within a week and went on increasing, the fingers became warmer and warmer, and the power in the muscles began to return, so that when she left, about six weeks after the operation, she was in a fair condition, and had lost that peculiar shiny aspect of the fingers which she had when she came into the hospital,

and was rapidly regaining the power in the muscles supplied by the injured nerve. The interest of this case is the immediate return of sensation after the approximation of the nerve ends, its disappearance for a time soon afterwards, and its reappearance followed by steady progress towards recovery a week later.

The next case is another instance of complete division, and is a very good one to contrast with the last. The patient is a man æt. 23, who has only recently been operated upon. He was admitted on June 17th. Seven weeks before admission he cut his wrist across the front. The wound was sewn up, the nerve, which was divided, being brought together at the time by means of fine catgut. In spite of the nerve having been sutured immediately after the accident, there had been no return of sensation, muscular wasting had been steadily taking place, and there were present all the appearances usual in division of a nerve. Eight weeks after the nerve had been properly sutured, no benefit whatever had followed. At first sight, of course, the presumption would naturally be that the stitches had given way, that they had torn through the ends of the nerves in which they had been placed, or that they had melted too soon. Bearing these possibilities in mind, but being at the same time fully aware that the nerve might after all be found to be perfectly united, I thought it best to explore the nerve to make quite sure of its condition. So I cut down upon it a few days ago, and found it very much mixed up in the scar tissue about the wrist, but the continuity of the nerve was perfect; it had evidently been sutured very well, there was no bulbous enlargement, and apparently nothing could have been better than the state of affairs found. Yet in spite of that there was, as I have said, not the least attempt at any renewal of the natural condition of the parts supplied by the nerve. That is a very interesting fact, which may perhaps raise some troublesome questions in the matter of treatment. It might be said in a case like this, as the nerve had been sutured before and no good had come of it, that the best treatment would be to cut out that portion of the nerve which had been involved, and make a new union, in order to bring about a better result than had occurred from the previous operation. But that is not the right thing to do. It is quite impossible to foretell with

certainty what is really going to happen in a case like this man's. When I found that the union at the point of suture was good, and that there was no bulbous enlargement, I did nothing but separate the nerve freely from cicatricial tissue and close the skin wound. ·

Now in a case of this kind, the first thing the patient is anxious to know after the operation is your opinion as to his prospects of recovery. That is the interesting point in this case,—what are this man's prospects of recovery? Well, it is very difficult to say what will happen, but I think you may go so far as to say that in these cases of immediate suture of divided nerves there is no reason to altogether despair of a good result, or at all events of partial recovery, although some months may elapse before any symptom of improvement shows itself. I know of one case myself in which nine months elapsed between the time of suturing and the appearance of the first symptom of improvement. I should not be surprised to see this man—if we could see him then—at the end of twelve months or two years, with a hand practically sound, having regained all its sensation and the greater part of its power. It is quite certain that many of these cases which show no sign of improvement in the early stages, eventually get what is called quite well. I remember another patient of my own, in whom I exposed the nerve under very similar circumstances, except that the exposure was above the elbow. I found the nerve had been properly sutured, although no improvement had followed. Having ascertained that the union of the nerve was good, I decided to leave it without interference for a time. Twelve months afterwards I saw the man, and I should hardly have known that he had sustained any injury at all. There is no reason, therefore, to despair in these cases.

I asked you just now, in speaking of the first case, to bear particularly in mind the fact that the pain caused by pressing on the injured nerve shot down into the fingers. That is the natural condition in any case of injury to a nerve—the pain shooting down into the distal parts of the limb. On the other hand, if the pain, instead of shooting downwards, passes upwards towards the central parts, one of the most serious symptoms you can have in connection with nerve injury arises.

There is a man who was admitted on January 27th; he was in Grosvenor Ward. Fourteen weeks

before he came into the hospital he had sustained a fracture above his right elbow, which was treated in the ordinary way and appeared to do well. He had been an out-patient of this hospital since November 17th, the accident having happened three weeks before that date. Everything seems to have been satisfactory excepting that he suffered from constant pain about the inside of the elbow, which nothing seemed to relieve. After he had been attending as an out-patient for some time he was taken into the hospital on account of this acute pain about the inner side of the elbow whenever he over-bent the joint, and whenever any pressure was made upon the situation of the internal condyle. He was a strong big fellow, and did not appear to be suffering pain. Upon examining his elbow it was quite clear that there was something wrong; there was an irregularity and bossiness about the inner side of the lower end of the humerus, which showed clearly the situation of the fracture which he said he met with at the time of his accident, and over this irregularity the ulnar nerve seemed to run. Pressure on the nerve here, no matter how slightly, or acute flexion of the forearm so that the nerve was bent over this projection of bone, caused pain, which was extremely acute, as his expression of face clearly showed. The pain did not shoot down into the hand, as is usually the case, but up to the shoulder; and this fact, as I have already said, gave the case a much more grave character than it would otherwise have possessed. When nerve pain of this kind passes towards the central parts above the seat of injury the patient is almost invariably the subject of ascending neuritis—a condition which after injury to nerves is one of the most intractable which can be met with, and one of the most difficult of all to deal with. In this particular case I thought that there might be some adhesions about the nerve, probably under the irregular portion of the bone, and hoped that the pain might be remediable, since it might be due to the dragging of the nerve upon these adhesions. I therefore cut down upon the nerve and exposed it very freely, and found it was matted by adhesions and cicatricial tissue. There was no sign whatever of there having been any laceration of the nerve. I loosened the adhesions, stretched the nerve, and sewed up the wound in the ordinary way, hoping the case would do well. The imme-

diate result was good; the man lost his pain altogether. He was very much pleased with himself, and I was very much satisfied with the case. But about five weeks after the operation, in spite of the previous entire freedom from discomfort, pain began to return, and within ten days of the commencement of its return it was as bad as ever it had been,—in fact, rather worse, because the pain not only shot up into the shoulder, but radiated up the side of the neck, showing the neuritis was extending.

My operation in this case had done no good at all. I knew I had to do with a case of ascending neuritis, and that is why I was careful to stretch the nerve as well as to free it. It was the stretching which no doubt accounted for the temporary relief from pain; when the nerve recovered from the effect of the stretching the pain became as bad as ever. A little later I saw the man again, because there arose a legal question in connection with the accident; his employers, who had been asked to compensate him, thought he was shamming. Now it is sometimes extremely difficult to detect malingering after injury to nerves, especially if there is some reason for deception. This man, for instance, knew the importance of the ascending pain, because he had heard me mention it several times in his presence, and such a pain of course he could simulate. He could therefore easily emphasise the pain towards the shoulder and neck, and minimise the pain shooting down to the hand. But there was one thing he could not simulate, namely, the wasting of the muscles. In the early stage of these cases there is no wasting and no loss of sensation, but a little later on when the disease progresses there is very distinct muscular wasting. There was in this case distinct wasting of muscles, and this wasting was altogether in excess of anything which could have arisen from mere disuse. That, of course, settled the question. I have seen him since, and the wasting is still more marked. There is no doubt in my mind that the man is going from bad to worse, and that finally, in all probability, this ascending change will further affect the central parts of the nervous system, and then other symptoms will arise about which there will be no doubt. This is an interesting case taken in conjunction with the others I have mentioned, because it is a capital illustration of the comparatively hopeless

nature of these cases of nerve injury in which ascending pain is a prominent symptom. Of course in such cases of ascending neuritis, when operations like I performed here fail, questions as to other treatment arise. The patient's condition is distressing; it is probably hopeless from a truly curative point of view, but still temporary relief may be sometimes given in various ways. Constitutional treatment effects little excepting in gouty patients, who derive at times great benefit from drugs commonly used in the treatment of gout, notably colchicum. Local treatment, however, seems more certain to give relief, at least for a time. The most effectual local methods (after nerve-stretching) seem to be (1) longitudinal scarification of the affected nerve, (2) free application of the thermo-cautery at frequent intervals along the course of the nerve, and (3) the frequent repetition of multiple flying blisters over the nerve.

In spite, however, of all treatment the symptoms usually return, and in the end defeat the practitioner. There is one very singular thing about the pain in these cases of ascending neuritis, namely, that except when there is some exacerbation of pain the expression does not indicate that the patient is the subject of acute suffering, nor until the very advanced stage are there any signs of exhausting disease. This makes it all the more difficult to be quite sure sometimes about the genuine nature of these cases; the patients look so well and hearty that there is an inclination to regard them as malingerers. Even electrical tests are not always conclusive. Why the pain in these cases should not cause the same distressed expression of countenance that other pain generally does, I cannot tell.

Treatment of Anal Pruritus.—Make frequent lavages with chamomile water, boricated or combined with saponined coal tar; afterwards apply a soothing salve of vaselin and zinc oxide, and powder profusely with the following powder :—Pulverised camphor, 2 grams ; zinc oxide, 30 grams ; bismuth subnitrate, 30 grams ; talc, 40 grams, holding the powder in place with absorbent cotton. When the parts are less irritated, paint every other day with a 25 per cent. solution of nitrate of silver. A suppository of cocoa butter, cocaine and belladonna, can also be inserted every night.—L. BROCQ, in *Journ. de Méd. de Paris*, August 8th.

A CLINICAL LECTURE

ON

TUBERCULAR AFFECTIONS OF THE SKIN.

Delivered at the Hospital for Diseases of the Skin,

By THOMAS D. SAVILL, M.D., M.R.C.P., D.P.H.Camb.,

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GENTLEMEN,—Chief among the tuberculous affections of the skin is *Lupus Vulgaris*, and the first case we shall study to-day is a very excellent example of the affection. The patient, Mrs. Annie F—, æt. 31, has got, as you see, a broad crimson patch on the right cheek, measuring about two by three inches, of a reddish-brown colour, slightly raised, and slightly exfoliating on the surface, with fading edges, beyond which may be seen here and there small isolated, subcutaneous nodules. If you look at this patch closely, you will see that it consists, as lupus vulgaris *always* does, of a cluster of reddish-brown semi-translucent nodules embedded in the corium, which have a strong resemblance, as Hutchinson has so aptly pointed out, to the appearance of apple jelly. These nodules form the essential lesion in lupus. They may always be made out on close inspection. By their fusion they form the patches characteristic of lupus wherever it may occur, and by the changes which they undergo, to which reference will shortly be made, they form those red and white star-like cicatrices indicative of their evolution ; or by breaking down they constitute the ulceration in *lupus exedens*, as the older authors used to call it. They are deeply embedded in the corium, and gradually work their way to the surface. They constitute—and this is the point I want particularly to emphasise—the essence of the lesion in lupus vulgaris, and our treatment must be directed to the destruction of them, and particularly of their centres. This patient has no patch anywhere else, and the one which you see on the side of the face began as a little " boil," she says, which formed a head when she was about three years of age ; when she was living, strangely enough, in the healthy country town of St. Albans. He

family history is healthy, she says, so far as she knows, but there is one strange circumstance : she is the only child living out of thirteen brothers and sisters. All were born alive, but all died within the first three months of birth, from causes unknown to her. Such a history must point to either tuberculosis or syphilis,—the former more probably, because her mother never had any miscarriages. The patient is married, and has three children living and healthy. She is under the care of my colleague Dr. Dow, who has very kindly sent her here for you to see to-day.

The next patient is a young woman æt. 20 years, and you will see that she represents a later stage of the same condition. This growth on the nose began four years ago. She has been under treatment in a variety of ways, by ointment and internal remedies, at different hospitals. She derived no benefit, however, until she came here under my colleague Mr. Hitchins. He adopted a method of procedure which I believe originated in Germany, and is certainly very efficacious indeed. As the patient expresses it, a series of " holes were drilled in the skin by little wooden spikes " ("sphygmatodes" of the Germans), the object being to get into the centre of the little nodules to which I have just alluded. The next day the little wooden spikes are removed, and some strong antiseptic is poured into the holes ; the result is that the maximum of damage is done to the centre of the growth, and a minimum of harm ensues to the surrounding healthy tissue. There is very little scarring after this process, and you can see that this patient has practically got rid of the condition with a trifling scar. She has had forty-three holes drilled in about twelve sittings, and I believe the caustic employed was acid nitrate of mercury. There is another instructive point in this case. You will see she has a number of very typical scars around the neck, which were left by strumous abscesses and ulcers ; they formed when she was a child, and are in the favourite position. So far as can be made out, there is no history of phthisis in the family.

The next patient, Anne B—, is æt. 24. You will notice some slight scarring on her nose, and a brownish-red thickening of the skin, which you will see, if you look at it closely, consists of small nodules, each about the size of a split pea. The whole together forms a fairly typical appearance of lupus vulgaris. Her history is as follows. She is now twenty-four, and at the age of nine her leg and foot troubled her. She had a sort of abrasion on the foot, consequent on the habit of pattering about without shoes and stockings. On this foot, in the position of the abrasion, a small ulcer developed, which, she was told by her doctors, had the typical appearance of ulcerating lupus vulgaris. It was treated in various ways, but notwithstanding this it spread. During the last two years the limb below the knee has become swollen by a kind of solid œdema, and you may see the lymphatics are marked out by red streaks, which feel hard to the touch. In other words, there is a general lymphangitis, which is regarded as a sort of elephantiasis, but it is really a tubercular lymphangitis. You can see here and there the little nodules I have described, whose character corresponds with that of the other patients. This young woman is under the care of my colleague Dr. Eddowes, by whose kind initiation she has attended to-day. It is thus fifteen years since she incurred lupus vulgaris in the foot. Within the last three years the nose, which is a more typical situation, has become involved, so that you see the disease is auto-infective, and there is no doubt this is lupus vulgaris. The probability is that she somewhat neglected this foot because it was out of sight ; now her nose is involved she regrets that neglect.

I think these three cases give us a very fair idea of the nature of lupus. Lupus vulgaris may be summarily defined as a chronic disease of the skin, characterised by a collection of reddish-brown, semi-translucent ("apple-jelly") nodules embedded in the corium (the condition is dermal, not epidermal), which give rise to some general thickening and desquamation, and which have a tendency to ulceration and to result in cicatricial atrophy. Some of the cases tend to ulcerate (lupus exedens of old authors), while others exhibit no such tendency (non-exedens). Their favourite position is the face, especially the nose, and particularly where the mucous membrane joins the skin. The disease almost invariably starts quite early in life—in childhood. The patches are rarely symmetrical, and they occasionally affect the limbs—in 20 per cent.

of the cases, according to Kaposi.* They rarely affect the scalp or genitals, but may occur elsewhere. These cases are more frequent in Germany than in England.

We have, then, in lupus vulgaris an *infiltrating*, *scarring* eruption in a *young person*. If you get such a condition, it practically means one of three diseases—syphilis, lupus vulgaris, or scrofuloderma. I have written on the board the leading points by which one diagnoses lupus vulgaris from those other conditions. I may say that leprosy gives rise to similar nodules, and, curiously enough, the leprosy bacillus is indistinguishable from the tubercle bacillus, both in its staining reactions and its size. But in England we practically never meet with leprosy now.

Lupus Vulgaris always begins before puberty, or practically always; it is of slow course, running for months, or, if left alone, for years. It ulcerates only when provoked, or when near a mucous orifice. The ulceration is invariably superficial, and has a rounded edge; and the lesion always consists of these "apple-jelly" nodules, which are quite obvious on pressing or stretching the skin. Lupus vulgaris never involves bones, and the administration of mercury and iodide of potash only do harm.

On the other hand, *syphilitic lesions* mainly affect persons of adult life, and begin at that period. They progress rapidly, and when they ulcerate their march is accelerated, so that they will do as much damage in a few weeks or months as lupus will in as many years. When the syphilis ulcerates it forms a deep ulcer, with a sharp-cut edge and abundant secretion. When occurring on the face it is very apt to extend to the bones, and is readily amenable to treatment by mercury and iodide of potash.

Scrofuloderma is the third of the conditions which have to be diagnosed, and which dermatologists still agree to differentiate from lupus. There are only three ways in which scrofuloderma may be distinguished: there are no apple-jelly nodules; the ulcers have soft, red, thick, undermined edges, instead of being superficial ulcerations; and the disease is nearly always connected with caseous glands or sinuses, or scars from bone or glandular disease.

* 'Lectures on Diseases of the Skin,' p. 543.

Now a word or two as to the difference between *lupus erythematosus* and *lupus vulgaris*. It is unfortunate that lupus erythematosus has come by the name lupus, because this supposes a resemblance to the other disease. But apart from its name and its tendency to come on the face, there is but little resemblance between the two. Now the grounds upon which lupus erythematosus may be regarded as a *non-tuberculous* affection, and therefore as differing *in toto* from lupus vulgaris, are (1) that the tubercle bacillus has never been found in lupus erythematosus; (2) no matter how extensive the disease may be, there are no tubercular lesions found internally, either in the lungs, glands, or bones, such as very frequently accompany lupus vulgaris; (3) lupus erythematosus does not spread by nodules, which is always the case in lupus vulgaris, but it extends by means of a raised edge more resembling seborrhoeic eczema than anything I know of; (4) lupus erythematosus never ulcerates, whereas lupus vulgaris, like all tubercular lesions, whether internal or external, has a distinct tendency to ulcerate; (5) lupus erythematosus is markedly symmetrical in its distribution—you are acquainted with the "bat's-wing distribution" across the bridge of the nose,—whereas lupus vulgaris is never symmetrical. (6) The diagnosis of lupus erythematosus is often cleared up by finding symmetrical patches of atrophy where the eruption has been—on the concha or lobe of the ear, or on the scalp, places which are specially avoided by lupus vulgaris. (7) Lupus erythematosus never occurs in children; lupus vulgaris always begins in early childhood, or practically always before puberty.

Next let us turn our attention to the *ætiology* of lupus vulgaris. (1) As regards age, I have already said that it always begins before puberty. (2) As to sex, there are about two females attacked to one male. (3) As regards social position and geography, it is more common among the poor than among the wealthy, and is more frequently met with on the Continent than in England. In Vienna about 66 per cent. of the skin cases are lupus; so that city affords a wide field for its study. (4) It is generally or very frequently found in patients who have other tubercular manifestations. Out of thirty-eight cases collected by Besnier, no fewer than eight were suffering from phthisis. (5) There is now no doubt that many of the cases are

due to inoculation, and probably infection is a more common cause than is supposed An instance has been known of a tuberculous mother inoculating her child by kissing it while it had rhagades on the face. Another case, which always dwells upon my memory very distinctly, is one recorded by Hutchinson of two boys, one of whom who was phthisical, tattooed the other, using to dissolve the Indian ink some of his own sputum. In a very short time after that operation the tattooed areas became sites of patches of lupus. Again, Jewish infants when being circumcised sometimes become inoculated when the operator is phthisical, or they used to be. Then there is the classical case of lupus, where a man incurred a wound on his fist from a phthisical patient with whom he was fighting, and developed lupus from that. Two of the cases I have shown you to-day illustrate inoculation, and I shall show you presently a man with a lesion on the back of his hand which he contracted from the hides of cattle which must have been tubercular. That case illustrates not only the fact that tubercular disease may be contracted in this way, but also shows that the tubercle of animals is precisely like that disease in the human being, giving rise to the same manifestations. Therefore we must regard direct inoculation as one of the most potent means for the propagation of lupus.

The *prognosis* of lupus vulgaris turns principally on three things: (1) its position, (2) its extent, and (3) the general condition of the patient. In the first case the position is favorable, the extent moderate, and the general condition of the patient fair, so that one may hope with treatment she will get entirely rid of it, and with very little scarring. Untreated, the disease will persist for years and steadily progress.

This brings me to the treatment of lupus vulgaris. General and hygienic treatment are very useful; that is, good food, fresh air, malt and cod-liver oil, and so forth. But these measures do not of themselves eradicate the disease, which goes on in spite of them apparently unchecked. So that we must always adopt some sort of local measures. I may perhaps here refer to the great expectations which were raised in 1890 when Koch tried with his tuberculin to eradicate the disease, on the principle of inoculating some of the toxic extract from tubercle cultures. But I am afraid these great hopes came to nought, for it was found that after the first few inoculations the patient became quite tolerant to the poison, even in very large doses, and Koch did not find the reaction occur. Finally it was found that though the disease at first underwent amendment, it ultimately marched on as rapidly as ever. There are four kinds of treatment which are applicable, according to whether there be ulceration or not. The first is the application of escharotics or caustics. These are chiefly applicable if there be ulceration; that is to say, if the nodules of tubercle are laid bare. The best of these caustics is acid nitrate of mercury. Carbolic acid is not of much use, because its action is only superficial; it causes a great deal of pain, and is very apt to attack the healthy as well as the diseased tissue. Salicylic acid has been tried, but no great effect has resulted, excepting in the form of 10 per cent. plaster or collodion. Nitric acid and other mineral acids like sulphuric are fairly good. Nitrate of silver is a very good caustic, and a solid stick may be inserted into the nodules, the same as the sphygmatodes I alluded to earlier in the lecture. Chloride of zinc is one of the best mineral salts to use, because it penetrates deeply into the skin. In Vienna a paste, called "Vienna paste," is used; its chief constituent is chloride of zinc. It is useless to apply this in the form of ointments or as plasters. Unna has great faith in strong mercury plaster, containing about 80 per cent. mercury; but in my experience it hardly ever goes deep enough. Another method of treating ulcerating lupus is by scraping, by means of a small blunt spoon, which is curved in different ways. The great art in using it is to be bold; you can do no harm, for this reason: the whole of the unhealthy tissue is infiltrated and as soft as cheese; wherever the spoon goes readily, the operator should scrape boldly. If bleeding be profuse, all the better, as it will show that the new vessels have been destroyed. Healthy skin resists the blunt spoon, so you can hardly do much harm. It is useful to apply a caustic afterwards. If the lesions are *not* ulcerating, the thermo-cautery is very useful; also when you want to check the bleeding. Next, there are the little pegs or sphygmatodes which I referred to in connection with the second case, and of the efficacy of which you have been able to judge. Plastic operations are

sometimes necessary, but, as a rule, Thiersch's and other grafts are not of much use, and certainly are quite useless until the whole disease has been destroyed, because the added skin will take on the disease just as readily as the old. I wish you to bear in mind how very little scarring remains after these extensive operations, however deeply the scraping may have extended. Bleeding is very readily stopped by a compress.

I have devoted most of the time to lupus vulgaris because it embraces the majority of cases of tubercle of the skin. Before passing to the other kinds of tuberculosis of the skin, I want to say a word or two about the comparative meanings of the terms " scrofula " and " tubercle." As you know, tubercle is the neoplasm of tuberculosis, and tuberculosis is a disease which is characterised by the growth, in various situations, of small granulomatous foci due to the introduction of the tubercle bacillus into the system of a person constitutionally vulnerable. That is a most important point, because you may introduce tubercle into many people without their acquiring the disease, for the bacillus of tubercle is an extremely feeble infectious microbe. The lesion it produces consists of a collection of round cells, a granuloma, just such as you get in leprosy, syphilis (gumma), glanders, and some other diseases. It is a low form of tissue consisting of numerous round cells, the interior of which, being furthest from the nutriment, tends to undergo degenerative changes. Usually one or more giant-cells are found; they occur in all granulomata such as I have mentioned. In tubercle these giant-cells often contain bacilli. I show you under the microscope a good section of tubercle, which was taken from a case of lupus vulgaris. The tubercle bacillus is about one-third the diameter of a red blood-corpuscle, having square ends; and it has a typical test which distinguishes it from other microbes except its first cousin leprosy, namely, that it stains readily with carbol fuchsine, and the stain is not discharged by sulphuric or nitric acid. The lesion resulting from the tubercle bacillus tends to undergo fatty and caseous degeneration in the interior; or it may undergo absorption, or become encapsuled and quiescent. All three of these processes take place in the skin, but calcification never occurs there, as it does sometimes in the lungs.

The next question is, how does this process differ from scrofula? The term has had many meanings, but at the present time it means a constitutional condition which *predisposes* to tubercular manifestations; it is not tubercle, but a tendency to tubercle—it may be said that it presents a soil favourable to the development of tubercle. Scrofulous patients are also prone to develop other microbic diseases; they will acquire and develop syphilis in a very bad form, and they have severer attacks of gonorrhœa than most people ; they also develop periostitis and necrosis more readily. Scrofulous people are likewise very prone to ulcers and inflammations, which in them have an indolent course and are painless because of their slow march. Thus a scratch or sore on the finger in such subjects, instead of healing by first intention, will become red and swollen, and perhaps form a bead of pus. Scrofula is certainly to a very large extent hereditary, or at any rate congenital.

We will now deal with the question of the identity of lupus and tuberculosis. That rests upon four facts. (1) In many cases of lupus, internal tuberculosis is found, and many finally die of phthisis. (2) In lupus vulgaris the bacillus may very generally be found in the skin lesion. The first case was found by Demine. There may be only one bacillus present, in a giant-cell, if the case be chronic. Dontrelepont, Pfeiffer, Krause, &c., have also carried on researches in the same subject. (3) Pieces of lupus have been successfully inoculated into the anterior chamber of the rabbit's eye and given rise to general tuberculosis. (4) It is due to the great French dermatologist Leloir that pieces of lupus were introduced into a guinea-pig's peritoneum, and were found to give rise to general tuberculosis. Under these circumstances we have no need to discuss the shape and nature of the growth ; we have absolute proof that lupus is tuberculosis of the skin.

Now let us turn to some of the other less common tubercular affections of the skin.

First, *Lichen Scrofulosorum.*—It is a pity it is called lichen. Indeed, gentlemen, this same remark might apply to much of skin nomenclature. It simply means that scrofulous patients are very apt to develop on the body little groups of flat, irregular, brownish-red papules. These do not inconvenience the patients very much, and very often are not noticed by them. The disease

consists of homogeneous, flat, hardly raised, scaly, painless, and non-itching papules, occurring chiefly on the trunk. It is not common after the age of twenty. By these characters it may be distinguished from papular eczema or syphilitic lichen. It is not a serious affection; it lasts sometimes for a good many weeks, and then gets well of itself. It may be treated by lead lotion or boracic ointment.

Erythema Induratum Scrofulosorum, or, as I prefer to call it, Bazin's disease, is a rare condition. The third case was an illustration of a somewhat similar affection. It affects by preference the legs of barmaids and others who stand a great deal, and who have a consumptive tendency. It consists of chronic, inflammatory, deep-seated, subcutaneous nodules usually situated in the calves of the legs. They are painless, or at any rate can generally be felt before seen. Subjects of the condition have very often chilblains in the winter; then, usually when they arrive at the age of seventeen or eighteen they develop one or more lumps under the skin, sometimes as large as a pigeon's egg, but more often the size of a hazel-nut. With that there is considerable congestion of the extremity, and indurated swelling or œdema. Sometimes the nodules break down, and it is then that the trouble begins, because it is very difficult to diagnose cases at this stage from syphilis, and thus it happens that subjects of the affection sometimes get wrongly accused. There are, however, four points which will assist us in the differentiation, besides the facts that Bazin's disease is very rare, and syphilis so common. (1) In erythema induratum scrofulosorum there is an absence of other syphilitic manifestations, and the presence of a strumous diathesis and history. (2) Antisyphilitic remedies only do harm. (3) They run a very prolonged course—months or years, whereas syphilis might be called rodent, because it gnaws the tissues away so rapidly. (4) It is not generally mentioned, but this disease is always very much worse in winter, and may practically disappear in summer. The treatment is by rest in a horizontal posture, and the application of a Martin's rubber bandage.

We now come to the vexed question of *Strumous and Tubercular Ulcers*. I have included them together on the board, but it is desirable to distinguish between them. The ulcer strumous is one which always occurs in connection with either (1) caseating glands, (2) with strumous bone disease, or (3) with some other form of tuberculosis. What is known as a tubercular ulcer, on the other hand, occurs on the edge of a mucous membrane in a person who is suffering from phthisis; it is the result of auto-inoculation from the excreta or secreta. Strumous ulcers may be diagnosed from syphilitic by their dark purple, undermined, ragged edges, whereas syphilitic ulcers are clean-cut, and the edges are not undermined. The discharge of strumous ulcers is thin and "curdy," and the ulcer may be granular and flabby. Strumous ulcers occur nearly always in children, and very often on the buttocks and feet. They have a good many appearances similar to syphilis, but in cases of doubt they may be scraped and the microbe sought for. Scraping, and the application of an escharotic, should always be the treatment of strumous ulcers. When occurring in old people there is nearly always evidence of scars in early life, otherwise it is almost impossible to distinguish them from syphilitic ulcers. They seldom heal spontaneously.

Lastly, we come to *Verruca Necrogenica*, of which I have a very good case to show you. This man has a rather remarkable history. He is now 39 years of age, and the lesion which you see on the back of his hand came eighteen years ago, when he was employed in leather-dressing and tanning. He was doing the "wet work," *i. e.* taking the hides from the tanning fluid and spreading them out. Verruca necrogenica, or "post-mortem warts," is a condition consisting of a warty growth, which appears on the hands of doctors, post-mortem porters, leather-dressers, cooks, butchers, &c. It starts as a crimson, flat, indurated papule, which spreads, and sometimes becomes warty, often becomes pustular, the pus drying and forming into a scab. The case before you shows very well another point about all tubercular lesions. You see that white and pink stellate cicatrix which is left behind, that is the cicatricial atrophy which is one of the events of tubercular lesions of the skin. In a great many cases lupus of the face takes on an appearance almost exactly like this hand, leaving a pink cicatrix behind where it has healed, with white stellate lines upon it. This man's hand has healed to this extent practically

without treatment. He wears a shield over the hand, and goes on with his work, but I want him to have it thoroughly treated. These lesions are always situated on the knuckles or backs of the hands, and a favourite position is the outer side of the index finger. It progresses slowly, and may last for months or years; Hutchinson mentions a case which lasted forty years. The photograph I show you gives a good idea of the condition of this patient some time ago, by which you will see how great has been the improvement under the use of a salicylic and carbolic ointment. The best treatment is thorough scraping; little damage to neighbouring tissue ensues, and there will be practically no matting of the tendons. Mercury, salicylic acid, and carbolic acid are the best remedies, and Unna's mercurial plaster often does good.

REMARKS ON APPENDICITIS.

A Clinical Lecture delivered by

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A case is reported by Fischer of a woman who entered the clinic for a sub-umbilical stercoral fistula, situated to the right of the median line, and which had followed an abscess in the same spot. The abdominal wall was incised layer by layer, and finally led down upon a purulent cavity, which responded in its situation, its shape, and size to the sub-umbilical space. In the lower external angle the ulcerated appendix was found.

It is not my intention, gentlemen, to describe all the lesions of the appendix, varying from simple inflammation to suppuration and gangrene, which cause perforation to occur, and which, when this accident occurs, produce peritonitis. Perforation of the appendix is not absolutely necessary to explain the purulent transformation of an exudation. The size of the abscess is very variable, the pus is large in quantity, and usually is a greenish liquid filled with pieces of false membrane, and is in fact more of a purulent serous nature than the true pus. It has a fœtid odour, which is sometimes fæcal or at others gangrenous; you will also sometimes find gas, small scybalæ, as well as gangrenous false membrane.

Regarding the symptoms of sub-umbilical abscess, you will find that they occur usually in the midst

of fairly good health, or after some indefinite digestive troubles, hypogastric pains with fever, loss of appetite, diarrhœa, or constipation, which are usually met with at the beginning of an appendicitis.

The symptoms which appear in cases of this pelvic abscess are similar to those due to perforation; they are very acute, there is sharp pain in the iliac fossa, sometimes in the neighbourhood of the umbilicus, with attacks of colic, nausea, and bilious vomiting. The pain then becomes generalised over the entire abdomen, but it will be found more severe over the point from which it has started, and from which it shoots out in every direction.

The abdomen, which in the first place is retracted, becomes swollen, there is absolute constipation, and the facies of the patient becomes abdominal in type. By examination you will find a more or less extensive pasty feel in the hypogastric region, and the abdominal wall will be found very resistent. Now, if the tympanites will allow of it, you will feel a mass extending beyond the median line, and especially manifest below the umbilicus. In many cases it will be pear-shaped, with the large extremity crossing the median line, while the pointed end becomes lost in the right iliac fossa. This mass is due to the formation of adhesions, as well as to the peritoneal exudations around the cæcum and the appendix, and also to the infiltrated condition of the cellular tissues. By percussion you will find complete dulness. When this condition of affairs is present there is as yet no pus, and absorption of this fibrinous exudation may occur.

But generally speaking there will soon be suppuration, and when this occurs it can be made out by a particular sensation of resistance which is given by the empty cæcum, and which has been compared to that found in a very soft piece of pasteboard dipped in hot water. Suppuration may occur as soon as forty-eight hours after the commencement of the symptoms. The latter generally become less marked, and then the local signs become more manifest. The doughy feeling increases, and you will notice a swelling in the hypogastric region, which takes on the form of a distended bladder, but fluctuation will only be met with when the collection of pus is of considerable size.

You will detect, however, a dulness on percussion, unless there is gas in the pocket. An œdema will be noticed, while the superficial circulation becomes more developed, and in the midst of an increase in the fever, pain, nausea, vomiting, and diarrhœa, the purulent collection will make its way outwards, and when the collection has perforated and become evacuated the patient will immediately feel better: often the quantity of pus which comes away is really surprising. It often has a fæcaloid odour, and may contain gas, fæces, various kinds of purulent bodies, and fibrinous false membrane.

After a few days you will often find that the fæces are coming away through the wound, usually from the third to eighth day, and then the pus will diminish in quantity, the fistula will close after a certain time, usually about a month, but sometimes very much longer.

When the fistula is a long time in closing, or in those cases in which it has no tendency to close, when the borders of this fistula present fungous growths of a pale appearance, then you should suspect tuberculosis; and if the abscess had its origin in the appendix, you are dealing with a tubercular localisation in that organ. Some nine months ago I saw, in consultation with Dr. McLeod, a young woman of some twenty-three years of age, who had had an operation for an acute appendicitis performed on her some three months previously to the time I saw her, with the result that an abscess was opened, and, if I remember correctly, the appendix had not been found at the time of the operation. This young woman presented a sinus at the point of the incision, from which escaped a certain amount of a thin serous pus and fæces. This sinus had closed at one time by local applications, and had again opened. The patient slept well, the appetite was fair, but there had been an elevation of the temperature for some time, although to no marked degree.

Examination of the lungs made by the doctor showed that there was dulness in one of the apices, but the patient did not cough, although she had the flushed skin of phthisis. I made a diagnosis of tubercular appendicitis, although I must confess no bacteriological examination was made; but from the character of the sinus, with its pale, unhealthy granulations, and the nature of the pus, I thought

that in all probability my diagnosis was correct, and it proved so.

Another surgeon was consulted, and he cut down on the old scar and endeavoured to close the sinus, with the result that this was an utter failure, and the patient soon afterwards developed pronounced tuberculosis of the lungs.

These abscesses, due to appendicitis, may open near the umbilicus, at other times between the umbilicus and the pubes, and more rarely they burst into the peritoneum, the bladder, vagina, rectum, or intestine.

Now let me mention some particular symptoms of encysted peritonitis and abscess. In the former you will often observe a distension of the umbilical cicatrix, as in ascites. The pain is quite as acute as in abscess, but the general symptoms are very much more serious than in the latter, although in some cases reported the general symptoms have been quite slight.

In abscess you will find no swelling of the abdomen; but, on the contrary, you will have a retraction of the walls. The tumefaction, which is situated in the median line and is globular in shape, will be found extending towards the right iliac fossa. The skin and the subcutaneous tissue will be found healthy, while the muscles and the aponeuroses will appear by palpation to be intimately connected with the tumour. Fluctuation is only found at a late date, while if you perform a digital examination *per rectum*, which you should never neglect to do, you will find a hard mass just above the prostate gland; while, if you are dealing with a female, a vaginal examination will reveal this mass in the anterior cul-de-sac. In making either a rectal or vaginal examination, you must never neglect placing the other hand upon the abdominal wall, in order to more distinctly limit the tumour. You should also pass a catheter, and you will find that by drawing off the urine the shape of the tumour will be in no way changed. Micturition is frequent and painful, and the patient will have frequent desire to pass his water without being able to accomplish it. In some cases the bladder troubles will persist after the patient is well of his inflammatory processes, and is caused by adhesions of the bladder to the anterior abdominal wall.

Now, gentlemen, when you have a case which has presented distinct symptoms of appendicitis, namely, a sharp pain in the right iliac fossa, between the umbilicus and the anterior superior iliac spine, and this pain is spontaneous, and also produced by pressure over the parts, when you have nausea, bilious vomiting, constipation, or diarrhœa, swelling of the abdomen, and a tumefaction occurring in the anterior abdominal wall, no matter what may be the seat of this tumefaction, the diagnosis of the case should be easily made.

Now the question arises, is this tumour formed of pus, or is it still in a fibrinous condition? To which I would reply that if the abscess is of any size, and the abdominal walls are thin, you will have in the way of general symptoms chills and fever, while as local ones you will have fluctuation, œdema, superficial circulation, and in a number of cases dulness on percussion; but there are many cases in which the abscess is small, and Roux believes that if there is no remission in the symptoms there is pus present at the end of forty-eight hours, in which case you will find an infiltration of the cæcum, which is empty, and thus there will be no doubt.

Under no circumstances should you resort to exploratory puncture, which is a fruitless and dangerous proceeding.

The famous Bernutz, in speaking of making distinction between a purulent collection in the peritoneum or in the cellular tissue, says that those symptoms which especially serve in distinguishing abscess from abdominal peritonitis may both be preceded by digestive troubles, while in partial peritonitis in the umbilical region at least those forms which give rise to pain of sufficient intensity to make one believe an abscess is present are usually quite considerable in extent, and have a series of symptoms which are very similar to generalised peritonitis. From this it results that in any inflammation which is limited to the peritoneum in the neighbourhood of the umbilicus, in which pain is as severe and has the same initial seat as in abscess, you will find general symptoms which are much more severe than in those which give rise to phlegmonous inflammations of the fascia propria, and which into the bargain give other characters to the pulse and to the fever. The pain does not offer in one or the other of these affections the same characters, and is not accompanied by the same condition of the abdominal walls. The latter are very much

retracted in abscess, and the amelioration occurs very much quicker and far more completely than in inflammation of the peritoneum, and will consequently allow us to judge of the infiltration of the abdominal cellular tissue, which differs from the superficial tumour, and which by deep percussion will give sonority.

In the cases of intra-peritoneal abscess collected by Velten the general symptoms were not very much developed, and from this fact it is well not to make a diagnosis according to their intensity or their slightness. An excellent symptom of peritonitis is the bulging forward of the umbilical cicatrix as it is found is ascites, as is also the mass found in the posterior cul-de-sac of the vagina. It has been said that the pus of suppurative peritonitis preferably makes its way out at the umbilicus, and the anatomical structures would be likely to conduct the pus of perivesical abscess up to the umbilicus. It has also been said that when an abscess has opened through the umbilicus an umbilical hernia would be met with later on ; but the adhesions which are produced at this time explain the reason why the former complication is not observed.

The bladder troubles, with a hard mass felt above the prostate or on the sides of the rectum, would favour the diagnosis of abscess. If the abscess is situated in the cavity of Retzius the integuments will be found healthy, the muscles and the aponeurosis are bound to the tumour, while the latter has the shape of a bladder, so that the catheter must be introduced in order to ascertain if the bladder is in a normal or diseased condition. Fluctuation is deep, or may not be present at all. The iliac fossa will be found free, while by rectal examination you will find a hard mass above the prostate, which will probably bulge out more on one side than on the other ; while in the female vaginal examination will show a soft rounded tumour between the cervix and the pubes, a micturition also painful and frequent.

The question now comes, is the abscess pre- or perivesical ? In the first case the abscess would be located more behind the pubes, and extend on the sides of the rectum, and would burrow its way out through the linea alba. In the second type the abscess would be found behind the bladder and above the prostate, and would make its appearance outwards at the umbilicus.

If you have not been present at the time of the general symptoms occurring at the beginning, which alone will allow you to make a diagnosis of probable appendicitis, you must endeavour to find out if there is any other cause for abscess, such as gonorrhœa, puerperal or purulent infection, elimination of some foreign body, and ulceration of the intestine. The elimination of biliary or renal calculi with infection of the gall-bladder or the kidney should also be considered. You must also not forget the possibility of an osteitis of the pubic or iliac bones, as well as an arthritis of the symphysis pubis. You must also remember that chronic lesions of the bladder produce hypertrophy of the prostate or a stricture of the urethra, or there may be ulceration of the bladder produced by calculi, foreign bodies, or an extension of an abscess from the prostate. While in the female you must consider the question of an extension of some pre-existing periuterine inflammation. I would also mention, for memory, symptomatic abscess due to tumours of the digestive tract.

Often you will find only gastro-intestinal troubles with alternating diarrhœa and constipation to explain the presence of these abscesses. The series of symptoms, namely, extra-intestinal troubles, severe pain in the iliac fossa at variable intervals, accompanied by constipation, the whole ending in a prevesical abscess, and the entire want of any former urinary trouble, can only be explained by the fact that there has probably been an appendicitis present, which is the seat of the trouble. If these abscesses are properly treated the patients will recover. In some cases the tumour may become absorbed, but in the majority it tends to expand and open out through the abdominal wall. If no communication be present between the intestine and the external sinus, the latter will rapidly close ; but generally the presence of fæces delays recovery, which only occurs after a certain number of weeks. And, as I have already said, in many cases a fistula will persist, and then you must consider the question of tuberculosis ; and in order to arrive at a definitive result regarding this, cultures and experimental inoculation especially should be made of the pus, in order to determine the presence of Koch's bacillus. In giving your prognosis you must not lose sight of a possible opening of the abscess into the peritoneal cavity,

which will naturally produce a rapidly fatal peritonitis ; and also you must remember that the abscess may open into the bladder, in which case surgical interference will be necessary sooner or later in order to properly care for the urinary reservoir.

Now, regarding the treatment, you all know that wherever there is a focus of infection, whether it be deeply seated or not, and when it may cause serious or fatal complications, your duty is to act at once and without hesitation. Consequently all medical treatment, such as the antipyretics, opium, &c., should be left entirely aside in the treatment of the abscess under consideration. I have already told you that puncture must not be thought of. The proper incision to select is one in the median line below the umbilicus, say at about eight or ten centimetres, and carried over the most prominent part of the tumour.

As soon as the abscess has been evacuated the walls should be carefully examined, but you must proceed with great prudence. You must endeavour to ascertain if there are diverticuli or any other similar collections which have been walled off. Then, after you have made sure of the condition, the abscess pocket should be irrigated with care, so that no adhesions will be broken, and using only hot sterile water for this purpose. After a thorough irrigation a large drainage-tube may be introduced, or the pocket may be kept dry by means of strips of xeroform gauze in the place of a drain.

The important question of suturing the abdominal wall so as to avoid a future ventral hernia must be here considered, but it appears to me preferable to secure a perfect drainage, in order that the pocket may granulate from the bottom upwards as quickly as possible.

Now, regarding the appendix, I would say that if you find it in your incision, it is better to resect it, because it may be the means of keeping up a sinus which may last indefinitely; and it has also been upheld, and I believe it, that the removal of this organ in no way increases the mortality. Now if you do not see your appendix, and if, in order to find it, you are obliged to manipulate the parts very much, I would insist on this point, and that is that you leave the appendix entirely alone, and do not look for it, because in so doing you will break up the adhesions already formed, which are the only means of preventing a general infection of the peritoneal cavity.

After the wound has closed up by granulation, the best means to prevent a future ventral hernia is to make your patient wear an abdominal binder for some time.

Let me also in closing remind you that your patients will have undergone considerable detriment to their general health, on account of the infectious process which has been present, and like all other infectious diseases and septicæmias, it is essential to take care of their general condition by properly directed medical treatment, which should be supplemented by a change in climate, &c.

We will now come to the operating room, and I will demonstrate to you the steps of the operation.

In the first place, you see I make an incision running along the outer border of the right rectus muscle, and I am careful in making it sufficiently distant from the muscle, in order not to involve the sheath of the latter. I now cut the muscular and aponeurotic layers, and I arrive on the peritoneum, which I carefully incise; this incision is, as you see, about 5 or 6 cm. in length. You also notice that I have ligatured all the smaller vessels that have given rise to bleeding, either in the skin or in the muscles, before I proceed ; and this having been attended to, I wash my hands and the surrounding skin in sterile water.

I will now proceed to find the appendix, and in order to do this I must follow the large intestine, which I here recognise by the longitudinal fibres, until I come to the cæcum ; but before drawing on the intestine I introduce my hand into the abdominal cavity to make sure that it is not bound down by adhesions, as well as to be sure that there is no collection of purulent matter—a thing which we can never be sure of before operation, although in this case I was not able to determine anything by a careful palpation. As I find nothing I will now search for the appendix. You will notice that the cæcum is much congested, and demonstrates what I said in the beginning of this lecture.

I have at last now found the appendix, and, as you see, it has taken me some few minutes, because this appendix is extremely small, measuring perhaps not more than four centimetres in length, and it is closely bound down along the cæcum by thick adhesions, which almost completely conceal it.

I now ligate the appendix at about a centi-

metre from the intestine, and I place a pair of small clamps just below the ligature, and having drawn everything well out of the wound, in order to prevent the escape of septic matter into the abdominal cavity, I incise between the ligature and clamps with a thermo-cautery. I carefully go over the surface of the appendix, and now carefully sponge out the incision with a dry aseptic pad, and see that there is no bleeding at any point. I drop the whole into the abdominal cavity. I never suture the peritoneum over the stump of the appendix, as I have never seen any need for so doing.

I will now proceed to suture the incision, which will be done with silk, and shall use no buried sutures, but will simply include the skin, muscles, and aponeurosis, but not the peritoneum in my suture, which, as you see, is a figure-of-eight—a most excellent suture in every respect for the closing of the abdomen.

I now place some dermatol gauze over the incision, over this some more sterile gauze pads, a large layer of absorbent cotton, and over all this the abdominal binder is pinned.

The future treatment of this case will in all probability be simple; I will order half an ounce of Epsom salts to be given forty-eight hours after operation, and until they have operated the patient will be kept on champagne and diluted milk. When once the bowels have moved, I will then increase his diet to light broths and milk, and by the end of the fifth or sixth day he will be eating toast and a little meat.

In order to avoid future ventral hernia I shall keep the patient in bed for at least three weeks, and when he leaves the hospital an abdominal binder will be worn for eighteen months. As a general rule the occurrence of hernia in the line of incision will not occur if you take proper care in the closing of the wound, and if you get union by first intention; but, as it is better to be on the safe side, I always order an abdominal binder to be worn after the operations necessitating an incision through the abdominal walls.

Acne Rosacea.—A French physician reports two obstinate cases of this disease quickly cured by the local application of oil of turpentine.—*Medical Standard.*

NOTES.

An Application of the Neuron Theory to the electric treatment of hemiplegia was communicated by V. Seletzki recently to the Kiew Medical Association, with which he has been very successful. It is based on the idea that in cerebral lesions, when the focus heals, the compressed portion of the pyramidal tracts will resume their normal condition and functions if the neurons have been kept from atrophy and the muscles from losing their habit of functional activity from lack of use in the meanwhile. He attains this by electric treatment, which exercises the neurons (galvanisation) and the muscles (faradisation). He first galvanises the head by placing the cathode on the hemisphere involved in the lesion, with the anode at the back of the neck. Then the hand is placed in salted water with the anode; the cathode at the back of the neck, after which the foot is galvanised in the same manner. The currents must be very weak and of brief duration. Muscular contractions are induced at the same time with an interrupter applied to the muscle, while the patient assists, by raising the hand, for example, when the deltoid is being treated. With this treatment he has restored motion to groups of muscles that had been paralysed from seven to fourteen months, which ordinary electrisation could never have accomplished. In one case of eruptive trophoneurosis of five years' standing, in which the pruritus rendered sleep often impossible, improvement was observed after the first *séance*, also in three cases of polyneuritis.—*Presse Méd.*, July 24th.

A PUBLIC DINNER has been promoted by the Society of Medical Phonographers in honour of Sir William R. Gowers, on the occasion of the distinction conferred upon him in recognition of his services to medical science. The dinner will take place at Limmer's Hotel, George Street, Hanover Square, on November 25th, at 7.15 for 7.30 p.m. Tickets, price 10s. each (exclusive of wine), may be obtained from *The Editor*, *1 Windsor Road, Ealing, London, W.*, or from *Dr. James Taylor, 49 Welbeck Street, W.*, and early application is desired. The chair will be occupied by Sir William Broadbent. A considerable number will doubtless muster on such an interesting occasion.

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THE

PREVENTION AND TREATMENT OF PUERPERAL SEPTICÆMIA.*

BY

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THE subject which I have chosen for this evening may appear a somewhat hackneyed one. Within the last few years various addresses have been given by distinguished authorities upon antiseptic midwifery, and the attention of the profession has been fully called to the subject. Nevertheless there are some important points about which opinions and practice still differ, and to which some further attention may not be out of place. Moreover, there is reason to believe that even now antisepsis has not yet throughout the country attained all the triumphs which it is capable of reaching.

The ground may be regarded as now practically cleared for prophylaxis and treatment by a general agreement in essentials as to the nature and origin

* Inaugural Address to Willesden and District Medical Society.

of the disease. Twenty years ago there was a wide belief that zymotic diseases, and especially scarlatina, played a very large part in the causation of puerperal fever. Bacteriology has now demonstrated that it is due to the septic micrococci. It follows that zymotic diseases can only lead to puerperal fever in one of two ways. First, most zymotic diseases are apt to be complicated by secondary septic processes, as in the case of the sore throat of scarlatina. Thus, from a case of scarlatina, the contagion, not of scarlatina but of septicæmia, may be conveyed to the puerperal woman. Secondly, scarlatina in the puerperal woman strongly predisposes to septicæmia. It is a very fatal disease if so complicated, but may probably run a mild course if antiseptic precautions prevent the access of any septic microbes. Add to this the facts that the puerperal woman has a special liability to develop scarlatina in the early days of the puerperium, and that the throat symptoms and even the rash are in her often but slightly developed, and it is easy to understand how the opinion arose of the origin of puerperal fever out of scarlatina. Rashes are a common symptom of septicæmia, and may more or less resemble that of scarlatina. It may thus be very difficult to distinguish between puerperal scarlatina complicated by septicæmia and septicæmia alone ; but generally the diagnosis can be made.

The verdict of bacteriology had indeed been anticipated by other evidence. Many years ago Dr. Longstaff, in his 'Studies in Statistics,' published a very interesting diagram, which I have reproduced in my ' Manual of Midwifery.' This consists of curves representing the percentage above or below the mean of deaths from various diseases in the years from 1855 to 1880. These show that the curve for puerperal fever is almost identical with that for erysipelas, but has no close resemblance to that for scarlatina. Modern views appear to explain the relation of the two former curves. The streptococcus of erysipelas, though at first described as an organism peculiar to the disease, cannot be distinguished microscopically or in cultivations from that of septicæmi Most

authorities now regard the two as differing only as varieties. Erysipelas is, therefore, a septic disease, though limited to the skin in the case of cutaneous erysipelas ; and its contagion is specially dangerous to the puerperal woman. There is another point which I believe that bacteriologists have not yet settled, and on which further knowledge is much to be desired. Streptococci are to be found in the mouth and alimentary tract of healthy persons, which also resemble more or less those of septicæmia. These may occur in the healthy vagina, or at any rate the vagina of a person not suffering from septicæmia. Such streptococci are non-pathogenic ; and I believe that bacteriologists have not yet succeeded by cultivation in conferring upon them an acquired virulence, or converting them into septic streptococci. But is it possible that the body of the puerperal woman may prove a more favorable incubator than can be imitated in the laboratory ; and may such organisms casually or normally present in the vagina, prove pathogenic in cases in which the vitality of the tissues is lowered by injury in difficult labour ? It is obvious that the answer has a very important bearing upon the problem whether it is sufficient in all cases to exclude the access of virulent organisms from without. Upon it depends the question whether the old distinction between autogenetic and heterogenetic septicæmia is so entirely obsolete as many have considered it to be.

Septicæmia, being dependent upon septic organisms, must be regarded as a group of diseases rather than a single disease ; and two or more of the group may be combined together. But one far outweighs the others in importance. In the puerperal woman, as in other persons, the most virulent forms of septicæmia and pyæmia are due to the *Streptococcus pyogenes*, because it has a greater power of penetrating deeply and growing in the tissues, while the staphylococci more frequently produce local suppurations. Fortunately, pathogenic streptococci are less generally diffused than the staphylococci.

It has been pointed out by several authorities that while antiseptic midwifery has converted lying-in hospitals from the most dangerous to the safest places in which a woman can possibly be delivered, no adequate corresponding improvement has yet been manifest in the general puerperal mortality of the country, and it is inferred that antiseptic pre-cautions are not yet sufficiently general. To illustrate this point I have compiled a diagram from the returns of the Registrar-General. Unfortunately, the Registrar-General's report is always published a year or so after date. The lessons to be derived from it are therefore rather more tardy than they might be, the report for 1895 being the last available.

For comparison with the general puerperal mortality, let me first recall what the results at lying-in hospitals have been, since the great transformation effected by the introduction of perchloride of mercury as an antiseptic.

According to Dr. Boxall's report of the results at the General Lying-in Hospital in 1890, after only four years' use of the mercury, replacing carbolic acid and permanganate of potash as antiseptics, the total death-rate was reduced from 10 or more to about 4 per 1000, and the death-rate from septicæmia or pelvic inflammation was rendered as low as about 1·1 per 1000. A still more striking reduction was that in the proportion of cases of pyrexia regarded as septic. Including even slight cases, this is recorded as having been reduced from 40 to 2·5 per cent., a ratio of 16 to 1.

These figures included an interval in which salufer was tried in place of mercury, with an unsatisfactory result ; and more favorable statistics have been obtained since at all the lying-in hospitals.

Thus, at the City of London Lying-in Hospital, as reported in Dr. Godson's Presidential Address to the Gynæcological Society, the deaths in 1870 were 52 per 1000, and so late as 1884–5 were 20·8 per 1000. At this hospital, also, mercury was adopted as an antiseptic in 1886. In the ten years from that date the total mortality was only 2·38 per 1000 ; and in the five years 1892–6 only 1·25 per 1000, with no septicæmic death. The number of cases, however, included in the latter proportion (2392 deliveries), is not sufficient to allow a fair average to be deduced.

Comparing with this the puerperal mortality for England and Wales, we have for the years 1889–95 the following rates:—4·05, 4·89, 5·24, 5·78, 6·51, 5·36, 4·57· The average for the ten years 1883–92 was 4·85 per 1000. The rate was therefore increasing steadily from 1889 up to 1893 ; and even in the last year recorded, appears to be but little better than the average of 1883–92.

Taking all the years together, it is probably double the death-rate of a successfully managed lying-in hospital. It is satisfactory, however, that a marked decline is shown in 1894 and 1895.

The returns for the various counties show in what way this death-rate is made up. The septicæmic death-rate in 1895 varies from 21 per million living in Dorsetshire and Lincolnshire up to 107 in Cheshire and no less than 135 in Westmorland. Cheshire, however, enjoys the distinction of the highest total puerperal death-rate, 216, compared with 210 for Westmorland.

In London there is a slightly better proportion of septicæmic deaths than the average, 53 as compared with 61, and a decidedly better propor-

consequence, many deaths have been transferred to the heading of puerperal fever. The years before 1881, that is the first six, cannot therefore be properly compared with those that succeed. Even so, however, the curve does not appear satisfactory. At any rate up to the last two years there is no progressive improvement, and the maximum of the whole series is so recent as 1893. It is to be trusted that the various exhortations to antiseptic midwifery which have been given since then are now having their effect. It will be seen from the chart that every change in direction in the line for puerperal fever has a corresponding change in the line for erysipelas, except that one maximum for puerperal fever, that of 1883, occurs a year later
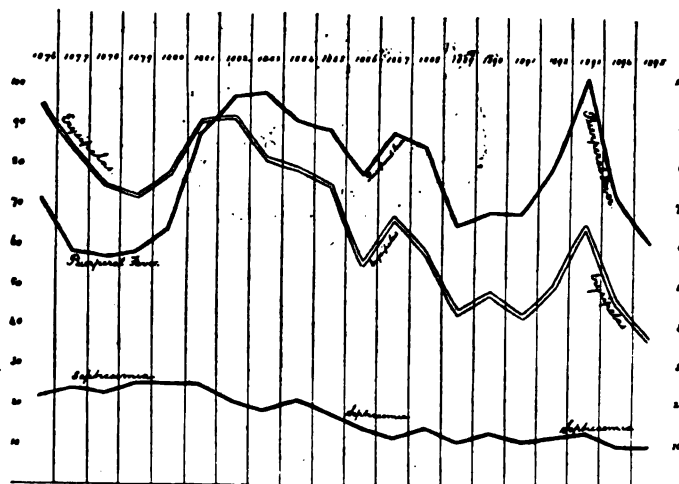
Erysipelas, Puerperal Fever, Septicæmia—Deaths per million living.   Twenty years, 1876 to 1895.

tion of other childbirth deaths, 50 as compared with 78.

In the chart I have given the curves indicate the number of deaths per million living, referred to erysipelas, puerperal fever, and septicæmia with pyæmia. As in Dr. Longstaff's chart, the curve for erysipelas has a very close similarity to that for puerperal fever. It will be seen that the curves for erysipelas and septicæmia with pyæmia show on the whole a steady improvement, doubtless due to modern antiseptic methods. In puerperal fever it appears at first sight that there is the reverse of improvement. This, however, is partly due to an alteration of practice introduced in 1881. Since that date letters of inquiry have been sent when deaths have been returned as due to peritonitis or other vague designation, and, in

than the maximum for erysipelas. But the line for erysipelas has a general downward tendency, while that for puerperal fever has not.

It cannot, however, justly be inferred that the care of practitioners is the only element affecting the septicæmic death-rate. In Dr. Longstaff's chart a curious result is shown, namely, that the curves of septic diseases are closely similar to the curve indicating the rainfall at Greenwich *reversed;* that is to say, septic diseases are most prevalent in dry seasons. It would seem that the septic microbes must be diffused in dust. This rule is even followed by a disease which one would hardly expect to follow it, or to conform as it does in its curve closely to erysipelas and puerperal fever, namely, "rheumatism of the heart," by which is meant a fatal cardiac complication in the course of

rheumatic fever. It would look as if fatal cardiac complications in acute rheumatism were of a septic nature. Since the days of Dr. Longstaff's statistics " rheumatism of the heart " is no longer a separate heading, but is combined with rheumatic fever. It is to be noted, however, that the maximum of the whole series of years under these headings is in 1893, as is the maximum for puerperal fever. In this year there was drought in spring and early summer, and the rainfall at Greenwich for the year was 4·1 inches below the average. The temperature was 1·8° above the average, the greatest excess since 1868. Notwithstanding the prevalence of anticyclones, the amount of wind for the year was above the average.

The problem of the prevention of puerperal septicæmia may be regarded as solved for the lying-in hospitals. The practical question which I have to put before you this evening is, how far the same methods are applicable to private practice, and whether any of them ought to be or may safely be omitted. In deciding what antiseptic precautions are necessary for private practice, it is desirable in the first place to fix on the minimum which is essential ; since otherwise, if numerous and trouble-some minutiæ are enjoined, practitioners who may perhaps have had excellent results for many years without the use of any special precautions, may make up their minds that they are unnecessary, and discard the whole of them. It is desirable, in the second place, that the procedure advised should not require any very special skill, and should be such that midwives can carry it out. It is also advisable, as regards measures that the nurse employs, that any to be universally adopted should be such that even a stupid and inefficient nurse is not likely to do harm with them.

Apart from the use of antiseptics, there are certain precautions, common to lying-in hospitals and private practice alike, to which all will agree. Thus no placenta or clot should be left to decom-pose in the uterus ; good uterine contraction should be secured ; a happy mean should be attained between allowing labour to be unduly protracted, and hastening it too early by forceps at the risk of laceration to cervix or perinæum ; all perinæal lacerations should be carefully united by silkworm gut or wire sutures, since the special liability of primiparæ to septicæmia probably depends upon the frequency of lacerations in their case.

Of antiseptic precautions, properly so called, by far the most important are those which aim at pre-venting the introduction of any pathogenic microbes into the genital canal. For it is only in cases of injury by difficult labour, or of decomposing material allowed to remain in the uterus, that the microbes ordinarily present in the vagina or cervix uteri may, if ever, become pathogenic. In the latter case the explanation may be that the sapræmia first induced, poisons the tissues, and diminishes their resistance to organisms which otherwise could not grow in them.

Precautions of this class can be carried out in private practice exactly as in lying-in hospitals, and undoubtedly ought to be. After the results of mercury in comparison with those of carbolic acid and permanganate of potash which I have quoted, it seems undesirable to seek for any other antiseptic. I am not aware that any of the newly invented antiseptics have had a comparative trial at a lying-in hospital ; and the fatal results which followed the trial of salufer at the General Lying-in Hospital have probably tended to discourage such experiments. Hands, therefore, before touching the patient, and non-metallic instruments, should be disinfected by thoroughly soaking, after cleansing, in 1 in 1000 solution of perchloride or iodide of mercury. For metallic instruments lysol 1 in 50, formalin 1 in 300, or carbolic acid may be used, and previous disin-fection by boiling gives additional security. The lubricant should also be antiseptic, and not weakly antiseptic like carbolic oil. Solution of perchloride of mercury in glycerine 1 in 1000 is very effective, but shields the fingers less than grease, and for my own part I prefer lano-creolin. In practice among the poor, probably the greatest difficulty is to secure that the nurse uses the same precautions as the doctor. Of course no sponges should be used for external cleansing, but cotton wool moistened with the antiseptic solution. Before labour the vulva should be washed thoroughly with soap and water, and afterwards swabbed over with perchloride or iodide of mercury 1 in 2000.

As regards the use of antiseptic douches in private practice, the problem is a much more difficult one, and has perhaps not yet been solved by experiment and experience. The single douche, after delivery, of perchloride or iodide of mercury 1 in 2000, generally employed in lying-in hospitals, may with equal advantage be adopted as

a routine measure in private practice. The doubt-ful point is whether routine douches should be used during the puerperium in normal cases. Of late there has been an increasing tendency to dis-countenance them, partly on theoretical grounds. Experiments have shown that the normal vaginal mucus has a power of destroying or inhibiting the growth of pathogenic microbes, probably on account of the presence of other microbes not pathogenic. If the secretion is purulent, or even if, from inflam-matory conditions, it is alkaline instead of acid, this power is lost. By washing away normal secre-tion with a douche, therefore, a natural protective influence may be lost, apart from the chance that a careless nurse may introduce septic microbes in using the douche. Unfortunately the secretion is not always normal, or, at any rate, does not always adequately protect. Some would solve the ques-tion by using douches only when the secretion as tested before labour has lost its normal acid reaction. During the early days of the puerperium, however, the alkaline lochial discharge prepon-derates over the acid vaginal secretion. And I have found it common enough, apart from preg-nancy, for cocci and even streptococci to be present in the mucus of the os uteri, although the vaginal secretion is acid.

I believe that it is, at any rate, true that there is danger in using douches of anything but a power-ful germicide in adequate strength. I think that this was illustrated in the following case, the only one of septicæmia which I ever met with among patients whom I have attended solely and not in consultation.

The patient was a young primipara. The labour was normal, except that the placenta was adherent and had to be artificially removed from the uterus. Douches of carbolic acid 1 in 40 were used for five days. The antiseptic was then changed to boric acid, on account of some local inconvenience. Up to seven clear days temperature and pulse and lochial discharge were absolutely normal. The temperature then suddenly rose to 104° with a rigor. Notwithstanding persevering uterine douches, and the scraping of some shreddy material from the endo-metrium, septicæmia was developed, and the patient died a fortnight after delivery. It was afterwards discovered that the housemaid had a lover, and that he visited her in the house without per-mission, and helped her in preparing the douches

for the nurse to use. He was suffering at the time from erysipelatoid inflammation in the neck. The probability is that in this case contagion was not conveyed at the time of labour, but only five days later, and that the douches may have been the means of conveying it. The condition of endometrium following the adherent placenta would furnish a suitable nidus.

It is to be noted that the triumphs of lying-in hospitals were first gained by the use of mercury, not only for disinfection of hands, but for routine vaginal douches during the puerperium. Thus, at the General Lying-in Hospital the following was the practice. A douche of perchloride of mercury 1 in 2000 was used immediately after labour. Per-chloride of mercury was used for washing and douching the patient regularly throughout the puerperium—for the first three days of a strength 1 in 2000, afterwards 1 in 4000. It was thought to be shown by experience that perchloride of mercury 1 in 4000, used as a routine douche, was not strong enough to be a safeguard against septicæmia during the first three days. I believe that the General Lying-in Hospital still uses routine vaginal douches of mercury, but the tendency is to limit their number and the time during which they are used. At the City of London Lying-in Hospital a vaginal douche of perchloride of mercury 1 in 2000 at a temperature of 115° is given immediately after the delivery of the placenta, and three similar douches subsequently at intervals of night and morning; then iodine douches, one drachm of tincture of iodine to the pint, are given instead of the mercury —for the first five days twice daily, then every morn-ing till the patient goes out. On the other hand, at the Rotunda Lying-in Hospital, Dublin, all routine vaginal douches have been discontinued, and the same practice is very generally followed abroad, and statistics are given to show that it is the safer method. At the New York Lying-in Hospital no douches are used at all, even at the end of normal labour, but there minute precautions are used in the application to the vulva of an occlu-sion bandage, containing a pad soaked in creolin emulsion 1 per cent., and changed every six hours. The total death-rate is about 4 per 1000. I believe that a similar occlusion bandage is used at the Rotunda Hospital. At this hospital, during the seven years of Dr. Smyly's mastership up to 1896, the total death-rate was 7·3 per 1,000; the

septic death-rate 1·9 per 1,000 in 8,997 deliveries. The majority of the septic deaths occurred in the first year of the seven. *

My own preference is still in favour of using routine vaginal douches of mercury where good nursing can be obtained; but where this is not the case, of not using them after normal labour, unless the discharge becomes offensive, or septic symptoms arise. It is doubtless true, that after normal labour, if antiseptic precautions against the introduction of any septic germs are perfect, no douches are required; but if antisepsis should fail at any point, the douches may afford an additional security.

In private practice I generally use the iodide of mercury 1 in 4000, and believe that, with due care, this is free from the risk of mercurial poisoning. Such risk is, indeed, a real one from the use of mercurial douches, and it is necessary to have an efficient nurse who will make sure that no excess of fluid is left in the vagina, and to stop the douches if any diarrhœa or tenderness of gums should appear. The iodide of mercury may be carried in tabloids, or in solution 20 grains to the ounce, with 15 grains of iodide of potassium. It injures metallic instruments less than the perchloride, does not precipitate with albumen, and is reputed more powerfully antiseptic. It certainly does sometimes cause irritation of mucous membrane, but usually not till after four or five days, when the douches can be used less often or discontinued, or the strength reduced to 1 in 6000. If douches are required and the mercury has to be left off, I incline to creolin emulsion 1 per cent., or formalin 1 in 500 to 1 in 1000. But I must confess that the results of the City of London Lying-in Hospital appear to justify the use of iodine, which was my own favourite antiseptic before the introduction of perchloride of mercury. It is not, indeed, considered a very powerful germicide in the strength of one drachm to the pint of the tincture; but, as in the case of iodoform, practical results may be better than bacteriological experiments appear to explain. Chinosol 1 in 250 I have found excellent in gynæcological work. It is very free from irritation, and may establish its claim to be a reliable

antiseptic for midwifery. Formalin also promises very well, from its success as an antiseptic in general surgery.

In the Guy's Hospital Lying-in Charity the results showed a steady improvement even before the introduction of perchloride of mercury as an antiseptic. For the first twenty-one years of its existence the total death-rate was 7·1 per 1000; for the next twelve years 4·4 per 1000; for the following ten years 3·4 per 1000. Since then the extern attendants have been required to carry perchloride of mercury to disinfect their hands, and a still further improvement has been effected. No routine vaginal douches are used, but a nurse is sent to use the douche in abnormal cases. In the last three years completed, comprising no less than 9864 deliveries, the total death-rate is 2·53 per 1000, and the septic death-rate ·72 per 1000. Hence, although septicæmia has apparently not been so completely banished as in some lying-in hospitals, the total death-rate is not much more than half the average for England and Wales, although one of the three years was a year of very unusual mortality, not of septic origin. The septic death-rate is less than one third of the average for England and Wales. I think these results afford ground for the hope that puerperal septicæmia may be further reduced throughout the country even in practice among the poor, where good hygiene and good nursing cannot be obtained as in hospitals.

The treatment of puerperal septicæmia is far less hopeful than the prevention. Yet even here some improvement may be expected. As regards early diagnosis, which is so important for successful treatment, I would call attention to the watching of the involution of the uterus, and the plan suggested by Drs. Stevens and Griffith for recording on the temperature chart the height of the fundus above the pubes, reckoning each inch above the pubes as indicated by the same line as each degree of temperature above 100. A specimen chart is shown, with the mean curve of involution, the main fall being during the day, a slight rise during each night. The only drawback is that for accurate observation bladder and rectum must be empty. The former can generally be secured even in private practice; and, if the latter cannot, some allowance can be made for it. If this is done, a check in the descending curve may show

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* "A Short Practice of Midwifery," by Henry Jellett. Appendix.

something wrong with the uterus even before the temperature is affected. A careful record of temperature is of course of even greater importance.

In treatment the first thing necessary is to remove any retained material which may furnish a nidus for septic microbes, by washing out the uterus. For this purpose mercury has the same superiority which it has as a disinfectant. Perchloride or iodide of mercury may be used, of a strength of 1 in 2000 at first, 1 in 4000 at the end of the douche. The best instrument is, I think, Budin's double-action catheter, of horseshoe shape

stage at which it is employed is all-important. In cases in which there is reason to suspect that the source of mischief is something retained on the placental site, the curette may be used if uterine irrigation does not bring down the temperature within twenty-four hours from its rise. An anæsthetic should be given, and the uterus first explored by the finger for any ragged surface. The best form of instrument is a large blunt irrigating curette, through which a constant stream of antiseptic fluid is passing. Harm may be done by the curette if fresh avenues for absorption are opened by it, and

(After Stevens and Griffith).

in section, the concavity of the horseshoe outside the tube allowing the return current. These are made either of celluloid or glass, the latter allowing disinfection by boiling. I prefer them with the orifice of entry at the end, not attached laterally at a right angle as it usually is.

The next expedient to consider is one much in favour in America, but one which I hesitate to recommend for general adoption for any but the highly skilled in manipulation. This is curetting the endometrium. While it is sometimes of great service, it is capable of doing great harm. The

the septic microbes are not wholly removed. And if it is employed when septic inflammation has already passed beyond the endometrium, only mischief from the traumatism can result. If the whole endometrium is curetted in the hope of removing all the tissue in which streptococci are multiplying, it is, I think, desirable to pack the uterus afterwards with iodoform gauze.

Next to local disinfection at the earliest stage, I think the most hopeful treatment of puerperal septicæmia is the injection of antistreptococcic serum, provided it is not commenced too late. I

have advised it of late in most cases of septicæmia seen in consultation, and have never found any untoward effect. Too often it fails to save. It can hardly be expected to do so if there is already purulent peritonitis, or pyæmic abscesses have formed on a large scale. But my experience is that, when it has been used, patients have at any rate made a longer fight with the disease than I should otherwise have expected, and I believe that in several cases it has saved life. I have not here a full report of any such puerperal case, but I will read one of a case of septic peritonitis after abdominal section. If incessant vomiting comes on after such an operation, with distension and other general signs of peritonitis, and the vomit becomes black by the third day, one generally concludes that there is no hope of recovery. I think, therefore, that the cure in this case may safely be ascribed to the serum.

" Bertha J—, single, aged 30, was admitted into Guy's Hospital, April 29th, 1897.

" Menstruation commenced at about the age of fourteen. It has always been irregular, and about five years ago ceased for a whole year. The periods sometimes last three days, sometimes longer. As a rule there is no pain with the menstruation, but on two occasions four years ago she had to lie up on account of pain at the periods. It was at this time that the patient first noticed a lump in the abdomen, which was much smaller than now. She also had a vaginal discharge at times, which continued off and on until the present time.

" She first consulted a doctor in January, 1896, about the tumour. It was thought at first that it might be a fibroid tumour of the uterus, on account of its solid character, and she was treated by ergot. The periods at this time were irregular, usually at rather long intervals, sometimes profuse with clots, sometimes scanty. Later she was under the treatment of Dr. Lloyd Roberts, of Manchester. The continuous electrical current was applied, and appeared to do good.

" On her admission a central firm tumour is found in the abdomen, reaching 4 inches above the umbilicus, and within 2 inches of the costal margins. On the right side, just above the level of the anterior superior spine of the pubes, a projection can be felt. The tumour has some mobility.

" On vaginal examination the os is found to lie forward near the pubes, but no mass can be felt behind pushing it forward. The tumour seems to move to some extent independently of the cervix, although a slight impulse can be communicated. The sound passed 3 inches, going in front of the tumour and rather to the left. It caused slight bleeding.

" The patient is nearly blind. Both corneæ are hazy, and the lenses more or less opaque, especially the right. Patient thinks that her eyes were inflamed when she was about five years old, but her sight was good until four years ago, when the tumour was first noticed. She gets attacks of pain in the eyes, after which they are worse."

My diagnosis was that the tumour was probably a malignant growth of the ovary, and I advised abdominal exploration.

The operation was performed on May 7th. The incision had to be extended to about one and three quarters inches above the umbilicus to allow sufficient access to the tumour. An exceedingly vascular growth was discovered, with large vessels as big as a lead pencil running over it in all directions. On being turned over the tumour was found to be adherent to intestines at the back, to the bladder in front, and also deeply in pelvis. During its separation a large amount of blood was lost, and preparations were made for transfusion of saline fluid, but eventually this was not done. A Keith's drainage-tube was placed at the lower angle of the wound.

The growth was found to be a lobulated tumour of the ovary, distending the broad ligament, with the Fallopian tube stretched over the surface, and about eight inches in diameter. On section it presented the structure of a soft sarcoma, with large tracts of degeneration, mucoid softening, and hæmorrhage. Microscopically it was composed of oval and small spindle-shaped cells.

The patient was sick from the time of operation, and the vomiting became gradually more incessant. On the 9th the vomit had become coffee-ground in appearance, and by the 10th it had become black. The fluid from the drainage-tube was found to contain an almost pure growth of streptococci. On culture they had the appearance of the most virulent form—no long chains, but only short chains of two and three cocci. From two to three drachms of the fluid were drawn

from the tube very frequently. The temperature oscillated, and pulse had become very rapid.

At 3.40 p.m. on the 10th 40 c.c. of anti-streptococcic serum were injected, and 40 c.c. at 10.30 p.m.

On the 11th, patient had some four hours free from sickness. On this day 40 c.c. of serum were injected in morning, and 20 c.c. in evening. Strychnia and atropia were given subcutaneously.

On the 12th 40 c.c. of serum were injected morning, and 30 c.c. at 6.30 p.m.

On the 13th 30 c.c. were injected in the morning. By this time vomiting had ceased, and the patient was greatly improved. Thus 240 c.c. of serum were injected within three days, after which the serum was discontinued.

The glass drainage-tube was replaced by a rubber one, which was gradually shortened, but not finally discontinued till June 23rd. The wound healed completely, and no recurrence of growth has as yet been reported.

In this case I do not know that it is necessary to conclude that the antiseptic precautions broke down at the operation and failed to exclude streptococci, or that infection took place through the drainage-tube afterwards. A degenerating cancerous tumour, adherent to intestine, may already have had streptococci in its interior.

It will be noted that in this case very large quantities of the serum were used. I think that often it may fail from being used in insufficient quantity, since the potency of its antitoxin does not seem at present to be a very high one. In puerperal cases I generally recommend 20 c.c. to start with, and at least 10 or 20 c.c. twice a day afterwards.

As regards surgical intervention I think there is a less hopeful prospect. If septicæmia after delivery arises from an old internal disease, such as a pyosalpinx or a small ovarian cystoma suppurating, then is the opportunity for surgery. I have had several complete successes in cases of this kind. But if suppurative peritonitis has arisen from fresh contagion received through the genital canal, I fear that abdominal section, with washing out the peritoneal cavity and drainage, affords only a forlorn hope. The reason probably is that there is generally enough septic inflammation to kill in the cellular tissue and other parts, apart from the peritoneum. But in some cases I have found

immediate relief to symptoms, though the septicæmia has afterwards progressed and proved fatal. Apart from the puerperium I have had successful results by abdominal section at the outset of general purulent peritonitis ; and success has been known even in puerperal cases. Probably the introduction of antistreptococcic serum into the peritoneal cavity after washing out may increase the chance of recovery.

If, therefore, there is evidence of fluid in the abdomen, and general signs pointing to purulent peritonitis, it would seem that the only chance for the patient, though a forlorn one, lies in abdominal section, provided that she has strength left to survive the operation.

Calomel and Acids.—The dangers that this drug presents cannot be contested, as the experiments of Ottolenghi prove. This author has given calomel in therapeutical doses to dogs, and compelled them to drink salts and acids. The animals always presented symptoms of intoxication, which appeared with more rapidity and severity than if the calomel had been taken alone. In these experiments the symptoms were not the same as those observed after the ingestion of corrosive sublimate. Ottolenghi affirms that, contrary to the current opinion, calomel is not decomposed in the stomach ; in fact, if we place calomel in solutions of salts or acids, no phenomenon will appear if the temperature is no higher than that of the body, 37° C. That which does not take place in the laboratory does not take place in the stomach in those cases to which we refer. The exaggeration of the toxic effect of calomel after the ingestion of salts or acids arises from the fact that its combination with albuminoid substances contained in the stomach will be facilitated and will yield products much more soluble, so that calomel, which is normally absorbed in very small quantities, will pass in much larger amounts into the circulation, thus provoking signs of grave intoxication.

Gaz. Méd. de Liège, June 24th, 1897.

'Soloid' Alum Compound (Burroughs, Wellcome & Co.).—Each 'Soloid' contains zinc sulphate 15 grs. and alum 15 grs. A douche useful in chronic vaginal discharges is made by dissolving two to four in a pint of lukewarm water.

THE FORCIBLE REDUCTION OF SPINAL CURVATURES.

BY

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THE interesting paper by Mr. Tubby and Mr. Jones in the 'British Medical Journal' of September 21st, on "The Immediate Reduction of the Deformity of

on whom I performed laminectomy, and six of these formed the substance of a paper I read before the British Medical Association in August, 1894.*

My object in doing laminectomy was to relieve the paralysis present to a greater or less extent in each case; but besides this, as I pointed out at the time, I found that after the operation it was as a rule very easy to correct more or less completely the deformity present. Before proceeding to consider the results obtained as shown by photographs before and after operation, it will be as well to consider

Fig. 1.

Case iv.—Showing amount of flexion of the spine in a case six months after laminectomy for caries and paralysis.

Spinal Caries," will no doubt render the following cases of a similar kind rather more worthy of notice.

During the last six years, I have had at the Children's Hospital here, many cases of spinal disease under my care, and naturally the degree of severity has been varied. It is unnecessary to detail the kind of treatment adopted, for in such cases it is advisable that each should be considered on its own merits. I have had in all eight patients

what is meant in this instance by a laminectomy. By most men it is thought to be simply a removal of constricting laminæ and spinous processes so as to allow expansion of the cord in cases where paralysis has supervened on caries of the spine. This, to my mind, does not go far enough, and certainly I should never perform such an operation with this end only in view. My idea of a properly per-

* "The Treatment of Spinal Caries and its Results by Laminectomy," 'Brit. Med. Journ.,' Sept. 29th, 1894.

formed laminectomy comprises removal of the spines and laminæ over the portion of spine diseased, so as to relieve the pressure, if any, on the cord; next, the location of the disease in the affected centra and careful removal of all caseous material that can be got at, no matter whether one,

Fig. 2.

Case i.—*Before operation*. Showing only possible erect position. Paralysis of legs and sphincters. Duration of caries one year.

two, or more vertebræ are affected; finally, when the wound is sewn up, with the help of assistants, the patient is held in such a position that the previously existing deformity is obliterated, more or less completely according to the duration of the

deformity in each case. This I have done very much in the manner described in Mr. Tubby and Mr. Jones' paper, depending somewhat on the position of the disease. In cases of cervical disease I have had strong traction made on the head whilst a poroplastic splint or plaster jacket

Fig. 3.

Case i.—*After operation*. Can now run about and do practically anything.

was adapted to the upper part of chest and head. If in lower parts of the spine I have had traction also made whilst fixing a plaster jacket; and at the same time I have had upward pressure applied to the affected region, the patient being in

the supine position, so that the spine at the diseased part was unfolded and made to assume a curve much more nearly resembling the normal. I have not found that such manipulations in any way interfered with the future comfort of the patient, and they certainly have an advantage from an æsthetic point of view in the results obtained.

In all probability the manipulation required is less severe when the spine and laminæ have been removed than when this has not been done, for in old cases of caries there is often a certain amount of adhesion between the laminæ, as can be seen in museum specimens. I can only say that in my cases it was not necessary to employ very severe traction to obtain the desired result.

During the convalescent stage, if the deformity has not been completely reduced, I have at a later date put the patient up again in plaster-of-Paris jacket, in such a manner that the deformity is still further reduced. I have done this by suspending the patient by a bandage about four inches wide passed under the most prominent part of the spine, this bandage being attached to a moveable bar, which can be raised if necessary, until the patient's head and heels only touch the ground ; this, it will be readily seen, allows the weight of the body at each end to unfold the spine still further. The Sayre's jacket is then applied, and when sufficiently dry the bandage is cut, and the patient put back to bed. To quote from my paper published in the 'British Medical Journal,' September 29th, 1894, "this mode of application I have adopted in several instances without the patients being at all inconvenienced, and I look upon it as a valuable means of diminishing spinal deformity."

Even in ordinary cases of caries this mode of application of a plaster jacket has many advantages. In the ordinary or vertical form of application the idea is that the weight of the body tends to straighten the spine ; obviously no one needs or wishes for a straight spine, i. e. a spine straightened throughout ; but what is advantageous is to have rectification or straightening of the spine at the spot where there is a tendency to undue flexion or undue extension : this is readily obtained in the manner described. Besides, the vertical position is very fatiguing and difficult to maintain until the laster is set, and it is no unusual thing for a

patient to faint during application ; whereas by the method in question the patient is more or less horizontal, the position can be steadily maintained whilst the bandages are carefully applied, and until the jacket is sufficiently set, and the patient can be at once placed in front of the fire to dry without risk of breaking the jacket. The accompanying photographs will, I think, show well what amount of improvement has been obtained by operation ; and when it is remembered that in each instance there was paraplegia to a greater or less extent, I think it will be conceded that the results fully justified the means. Besides this, I feel certain that a thorough operation, involving a removal as complete as possible of all tubercular matter, cuts short the course of disease ; at any rate, none of my patients, who were all of the worst type of spinal caries, were, after operation, confined to bed for more than three months (and some for less), with the exception of one in which a general spread of tubercular infection occurred, an occurrence which I must remind you is only too common in cases not so treated ; whereas similar cases of caries not operated upon block up hospital beds for many months, and then frequently drift to the infirmary or the workhouse. It would be advantageous to have reliable statistics of cases of spinal caries, with a view of ascertaining what proportion of hospital patients really get cured. It is surprising how they drift about, getting "cured" at one hospital to apply to another, and when they get worse or die it is considered only a natural result. So far as possible I have followed up my own cases, and it has surprised me to find so many dying after a variable period. The worst cases and the least promising in every way have been those on which I have done laminectomy, and these are the very cases that have stood best the lapse of time, since all those referred to in this paper have been operated upon over three years ago, and one of them more than five years ago.

It has been argued against laminectomy that it interferes considerably with the spine as a basis of support, and that it results in restricted movement of the back. Would it not be more accurate to state that the disease for which the operation is undertaken—caries—is really the true cause for both ? for the centra are first undermined, and then the weight of the head or upper part of the body

is constantly transmitted through a weakened spine in such a manner as to produce deformity and rigidity, the latter at first muscular, tending to counteract the deformity which finally becomes more or less fixed, producing a pathological rigidity.

That the removal of the spinal processes and laminæ can of itself interfere with the stability of

Fig. 4.

Case iii.—*Before operation*. Caries of three years duration. Unable to stand without support. Paralysis of legs, with rigidity and wasting.

the spine seems to me absurd, as these portions of the spine under natural conditions do not transmit the weight of the body ; hence how can their removal affect a function which they do not possess ?

The illustration of Case iv, showing the amount of mobility of the spine after laminectomy, was taken

three months after operation for paraplegia with anæsthesia and affection of the sphincters. Previous to operation he had been under treatment for six months. After operation on the lower dorsal spine he soon lost all his symptoms, and at the end of six weeks was allowed to walk. One might ask if such a result could be expected by recumbency alone for six weeks (see Fig. 1).

Fig. 5.

Case iii.—*After operation*. No lateral curvature, slight dorsal curve. Can now walk and run satisfactorily.

The illustrations of Cases i and iii show the amount of spinal curvature before and after operation. The first patient could only walk a few steps in the attitude depicted, and before operation lost even this power. The second case had to be supported for the purpose of

having his photograph taken, and here the considerable lateral and posterior curves were entirely got rid of by operation (see Figs. 2, 3, 4, and 5).

Case v was a child of three years with paraplegia up to the arms, and admitted in a critical condition on account of breathing being diaphragmatic only, consequently a photograph before operation was impossible; but the amount of deformity in the cervico-dorsal region may be judged by the fact that the chin was one and a half inches below the level of the top of the sternum.

All these patients are now in the best of health, and certainly the movements of the spine are almost as free as those of a normal spine. It is scarcely necessary to repeat that these cases have stood the test of several years.

These are some of the results after operation. In cases that do not require laminectomy we have been in the habit at the Children's Hospital of applying a constant extending force by what is known as Hilliard's apparatus, supplied by Hilliard and Son, of Glasgow, with very satisfactory results. In this apparatus extension of the spine is obtained by constant traction on the pelvis by a pelvic band and counter-extension on the head by a head-band; the mode of application is shown by the illustration, Fig. 6. By the use of this apparatus in early cases of caries deformity is prevented, and prevention of deformity is a valuable result. In cases of existing deformity the apparatus is more valuable if a sand-bag is applied under the most prominent part of the back. I have obtained the best results with this apparatus in cases of cervical disease, then in dorso-lumbar caries, and would certainly recommend the apparatus in all cases where the deformity is not already fixed by bony changes.

There can be no doubt but that a spinal curve such as exists in these cases of spinal caries is due to the patient being allowed to walk about or to lie on a bed which accommodates itself to the spine rather than the spine accommodating itself to a hard bed, in early stages of the disease. In most cases the curve is formed so gradually that it is not noticed until it is pronounced.

In private practice we seldom come across cases of marked curvature, because earlier notice is taken of the condition, and means adopted to prevent the curve becoming more marked.

Criticising for a moment the method of Drs.

Calot and Redard, it seems to me that any manipulation done in the dark is not sufficiently surgical. I should not hesitate myself to perform a laminectomy on any acute case of spinal caries where there was reason to think that caseation existed, removing the caseous matter and correcting the deformity in the manner already detailed. Whether or no paralysis existed, or was threatened, to my mind is immaterial, the paralysis only indicating an extension of a pre-existing disease. Old cases of spinal caries in which the deformity is absolutely fixed, and in which there is evidence from lapse of time that the tubercle is quiescent, will admittedly be best left alone. Whether there is an intermediate class of cases which can be suitably treated in the manner of Messrs. Jones and Tubby is a point which can only be settled by experience.

It may be argued that it is impossible in the course of a laminectomy to remove all the carious material; this is quite true, but it is astonishing how much can be removed, and it is open for anyone to ask in reply, in what operation for tubercular disease does every particle of tubercular matter get taken away? In most operations for tubercle the object is to put the patient in such a condition that he is able to overcome the small amount of material left behind, and this I claim, in the disease under consideration, can be more satisfactorily done by approaching a carious spine from behind and draining vertically downwards as the patient lies in bed, than by waiting until an abscess forms somewhere in front, and takes a tortuous path to the surface.

It is also argued that about half the cases of paraplegia from spinal caries get better if left alone; this means that the other half disappear or die, and it is admitted that in the half that lose their paralysis relapses are common, recovery is often imperfect, and of course the caries remains to get better if it can.

It seems to me to be a matter for regret that the French surgeons do not carefully look up what has been done in other countries before introducing so-called new methods. In our own country we even go to the other extreme, and look up what has been done by Continental surgeons, to the neglect of our own literature.

It may perhaps interest many to learn that attacking a spinal abscess by cutting down on to

the vertebræ themselves was suggested as far back as 1887 by Dr. Thomas Laffan at the Dublin meeting of the British Medical Association. To my mind it has strong recommendations in suitable cases. This can be done without removing both laminæ, and in the dorsal region can be done without interfering with either.

I would suggest that removal of the spinous processes only, as recommended and performed by the two French surgeons, with a view of rendering less noticeable an existing deformity without attacking the actual disease, is a procedure that has only its æsthetic effect to recommend it.

The actual removal of the caseous foci before attempting the reduction of the deformity is to my mind a more scientific procedure, which from my own experience I can confidently recommend.

In one of my cases which did remarkably well for two months, tubercular meningitis was set up by, as it afterwards seemed probable, a caseating gland. At the post-mortem the amount of repair in the spine far exceeded my expectations. Such repair is impossible after forcible rectification when the caseous mass is left behind; so that one anticipates that the after-history of such cases will include many instances of relapse, and many cases in which the disease has run its ordinary course even if no aggravation has occurred.
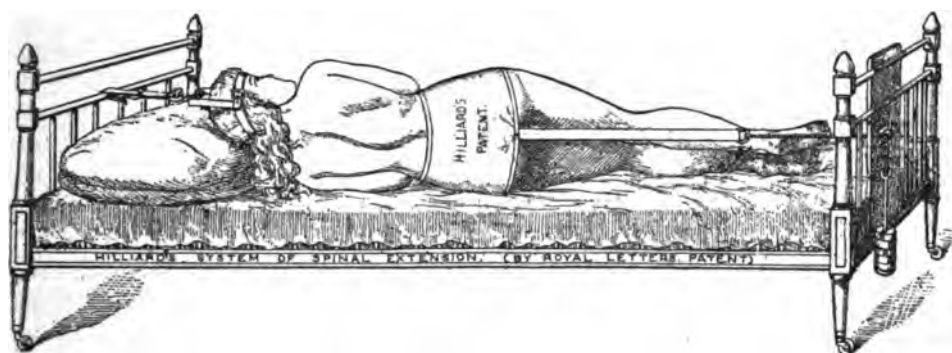

Fig. 6.—Resilient traction.

NOTES.

Colopexy for the Relief of Prolapsus of the Rectum.—Bryant ('Annals of Surgery,' August, 1897) thus operated in a case of inveterate prolapse of the rectum, which had not been materially benefited by the formation of an artificial anus.

An incision three inches in length, parallel with Poupart's ligament, was made down to and through the peritoneum. The peritoneum was separated from the superimposed tissues at either side for an inch at least, but further above than below. The gut was pulled upward firmly, causing the prolapse to disappear entirely; and while the gut was thus held, effort was also made to draw down any relaxed tissue of the rectum that might be within reach. The mucous membrane only was relaxed, but not to a sufficient degree to permit its appearance at the anal opening. During firm traction upward on the gut the peritoneal flaps of the wound were joined to it by quilting and continuous sewing with silk, the stitches including the muscular coat of the intestine. Six silk sutures were then carried through the borders of the abdominal wound, and so as to include the muscular coat of the gut, behind the longitudinal band. The longitudinal band was then drawn forward into the wound almost to the external limit, and the sutures tied firmly, thus causing the border of the wound to grasp firmly the entire band and some portion of the intestinal wall. The wound healed promptly without untoward manifestation. The patient was kept in bed for three weeks, since which he has been allowed entire freedom of action in all respects. No protrusion has been seen after defæcation or with the severest strain since the operation.

As a result of the operation the patient was apparently cured, but later developed a hernia at the seat of incision. Bryant has collected twenty-nine cases of this operation with seven recurrences. There were no deaths. He offers the following conclusions for consideration :

That the results in the experience of others with colopexy, and the present outcome of this case, bespeak a continued effort in this direction with a well-founded belief in the attainment of satisfactory results in proper cases.

That the brief duration of many of the cases at the time of report and the varying methods of fixation of the bowel to the abdominal wall bespeak further experience in these matters before positive conclusions are expressed.

That fixation of the bowel by sewing it to the deep tissues of the abdominal wall at a point independent of, yet conveniently near to, the incision offers a satisfactory method of anterior fixation—*Therapeutic Gazette*, October, 1897.

Physiological Effects of Castration in Women.—With regard to the sexual appetite, after removal of the ovaries it persists in 26 per cent., and is either diminished or abolished in 74 per cent. After removal of both the uterus and ovaries, appetite is more frequently lost than when the uterus is left ; while after removal of the uterus alone, the ovaries remaining, the appetite is still lost in about 25 per cent. of cases. It should be stated, however, that the figures with regard to uterine castration are based upon eleven cases only.

Removal of the ovaries arrests menstruation immediately in only 62 per cent. of cases ; 20 per cent. menstruate irregularly during the first twelve months, while in 17·5 per cent. of cases menstruation continues, and may be even profuse and intractable. The cases in which menstruation persists are explained by the supposition that the removal of the ovaries was incomplete. After removal of the uterus menstruation is very rare, but several cases have been recorded in which a periodic loss occurred after hysterectomy, and in these cases it is probable that a portion of the tube has remained in communication with the vagina. Wendeler has recorded a case of hysterectomy in which pregnancy afterwards occurred

in the stump of a tube which had remained permeable.

The following formidable list of functional disturbances may be met with after castration : (1) flushings ; (2) loss of memory ; (3) neurasthenic symptoms ; (4) alterations of character ; (5) congestive and hæmorrhagic phenomena (epistaxis, hæmoptysis, etc.) ; (6) disturbances of nutrition ; (7) disturbances of the special sense organs ; (8) mental troubles. These disturbances are constantly met with after ovarian castration, although they vary much in severity in different cases. After removal of the uterus alone, on the other hand, they are very rarely met with, and never become really severe. It seems therefore clear that they are due to the absence of the ovaries, rather than to the suppression of menstruation, a fact which only seems explicable by the theory that there is an internal ovarian secretion, which plays an important part in the nutrition of the nervous system. The only treatment which offers any chance of relief is the administration of ovarian extract. Both ovaries should never be removed except in cases of organic disease, which renders castration absolutely necessary.

The Charlotte Medical Journal, October, 1897.

Asphyxia from Vomiting in Intestinal Obstruction.—Two cases are reported by Dr. Stokes, in which the patients, suffering from acute intestinal obstruction, vomited in the early stages of anæsthesia such quantities of fluid as to interrupt inspiration. The siphon stomach tube, used before anæsthesia is begun, will prevent such misfortunes.—*Medicine*, Oct., 1897.

The Society of Anæsthetists.—At a conversazione to be held at the rooms of the society, 20 Hanover Square, on Thursday night, November 18th, Dr. Dudley Buxton, the President, is to deliver an ovation, entitled "Empiricism or Science? Anæsthetics, 1847 to 1897." This is commemorative of the semi-centenary of the introduction of chloroform. We understand that an interesting collection of the first appliances for giving anæsthetics, as well as portraits and autographs of the fathers of the science, will be shown. The present occasion appears to emphasise the fact that the practice of anæsthetics has now assumed a leading place, and that the old slipshod ideas no longer receive acceptance. In reforming the dangerous rule of thumb methods of administering chloroform this society has done, and is doing, much excellent work.

CONTENTS.

REMARKS

ON

TUBERCULOUS DISEASE OF LYM-
PHATIC GLANDS,

AND ITS TREATMENT.

BY

BILTON POLLARD, B.S., F.R.C.S.,

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CHRONIC enlargement of lymphatic glands, par-
ticularly of those in the cervical group, is one
of the commonest affections of childhood. In
association with some peripheral irritation the
glands corresponding to the implicated region
frequently enlarge without obvious signs of inflam-
mation. On the removal of the exciting cause the
glandular swelling generally subsides in the course
of a few weeks, but in some cases the enlargement
persists. It is then most probable that the glands
have become infected with tubercle. Whenever
such glands are removed distinct tuberculous foci
are found in the larger ones, and one or more
small foci of disease can nearly always be detected
in the smaller ones as well.

The disease requires for its development a
special susceptibility of the individual, or in other
words an inability of the tissues to withstand the
infection of tubercle bacilli, which in one way or
another have gained access to them. In many
cases the susceptibility is hereditary; in others it
appears to be acquired. Sometimes there is no
history of tuberculous diseases in the families of
the parents, and the affected child may have
several brothers and sisters in whom there are no
signs of tubercle. The exciting cause of the
glandular enlargement is some inflammatory affec-
tion of the regions connected by lymphatic vessels
with the glands involved. As a result of the in-
flammatory irritation the resisting power of the
tissues, already specially susceptible to tubercular
infection, are impaired, and they become an easy
prey to the tubercle bacilli which chance to be
conveyed to the affected gland.

There are two possible ways in which tubercu-
lous infection may be brought about. The bacilli
may gain admission to the peripheral lymphatics
from the surface, and may pass along the lym-
phatic vessels to the glands, and become intercepted
there. The occurrence of this mode of infection
is supported by the appearances often observed in
the diseased glands. The tuberculous foci are
often limited to the peripheral parts of the glands,
—in fact, to those parts where the afferent vessels
enter them. The glands may also be infected
through the blood-stream. Owing to inflammation
induced by the chemical irritants absorbed from
an area of simple inflammation the vitality of the
gland is lowered, and it becomes unable to resist
the development of tubercle bacilli brought to it
by the blood-stream. It is not possible to deter-
mine with certainty which is the more general
mode of infection. When the glands correspond-
ing to an area which is itself the seat of a tuber-
culous affection become tuberculous, it is almost
certain that the infection has been conveyed by
way of the lymphatics. In a case under my care,
in which disease of the inguinal glands complicated
tuberculous infection of a circumcision wound, or
in cases where strumous dactylitis of the little

finger is complicated by disease of the supra-condylar lymphatic gland, or again where a tuberculous affection of the throat is followed by tuberculous disease of the cervical glands, the conclusion that the infection has been conveyed from the peripheral focus along the lymphatic vessels to the affected glands is irresistible. In the more frequent cases, in which the peripheral in-flammation is of a simple character, the line of infection is not so obvious, but even in these cases it is quite possible for bacilli alighting on a mucous surface to be carried to a gland, and set up disease there without infecting the surface from which they were carried. The greater frequency with which the cervical lymphatic glands are affected with tuberculous disease than those of other external groups points to the entry of the bacilli from the mucous surface of the throat and that of neigh-bouring parts, but it does not settle the question of the mode of entry, for the tonsils, naso-pharynx, gums, ears, and scalp are certainly far more fre-quently the seats of inflammatory affections complicated by lymphadenitis than the limbs are.

Some recent researches of Dieulafoy ('Bull. de l'Acad. de Méd.,' 1895, April 30th, May 7th and 14th, abstracted in 'Brit. Med. Journ.,' 1895, June 1st) have an interesting bearing on the mode of infection. He inoculated guinea-pigs from hypertrophied tonsils and adenoid growths, which were apparently not tuberculous, and found that 12·5 per cent. of the animals inoculated from the tonsils, and 20 per cent. of those inoculated from adenoids became tuberculous. These investiga-tions obviously only prove that tubercle bacilli are frequently present in the follicles of enlarged tonsils, and in the recesses amongst adenoid vege-tations. They do not prove that either the tonsils or the adenoids were themselves tuberculous. This point has been strongly insisted upon by Cornil, whose histological investigations of very large numbers of hypertrophied tonsils, and of seventy specimens of adenoid vegetations, showed evidence of tubercle in only four of the latter and in none of the former.

The onset of tuberculous disease of the cervical glands is often referred to an attack of scarlet fever, measles, tonsillitis, or otitis. The specific fevers may operate by causing a lowered state of general health and nutrition, but it is probable that it is chiefly owing to the local inflammatory affections, which are associated with them or which follow them, that their influence as exciting causes is due. The mode of onset varies; generally in association with some inflammation of the tonsils, ears, gums, scalp, &c., one or more of the glands correspond-ing to the affected region become enlarged and tender. On the subsidence of the exciting cause the glands remain enlarged. In other cases the glands are accidentally discovered, and their enlargement cannot be traced to a local inflamma-tory cause. In other cases, again, the affection commences suddenly with acute inflammation of a gland, which presents all the appearances of being simple in nature. The inflammation progresses rapidly to suppuration. After the abscess is opened, the gland, instead of subsiding as it would in a case of simple infection, continues enlarged, although its tenderness diminishes. In the first case the glands have become inflamed owing to the absorption of irritating chemical bodies from the peripheral area of inflammation, and whilst in this state of diminished resistance they have be-come inoculated with tubercle. In the second case the tubercle bacilli have succeeded in im-planting themselves in a healthy gland, or at least in one which had presented no obvious signs of inflammation. The third case is an instance of mixed infection with pyogenic organisms and tubercle bacilli. In some of the cases in the third group it may be that the gland involved contained a small tuberculous focus at the time it succumbed to pyogenic infection, and that, owing to the injury sustained by the gland from the latter cause, the tuberculous disease was enabled to make more rapid progress than it had previously done.

In the early stages of tuberculous disease the glands are generally freely movable in the sur-rounding tissues and on one another. The super-ficial tissues are quite free and healthy. If only one gland were affected it might be mistaken for a new growth. It rarely happens that other neigh-bouring glands are not somewhat enlarged. En-largement of several glands in the same group is very characteristic of tubercle. The existence of other tuberculous lesions in the patient or in near relatives would lend considerable support to the view that the glands were tuberculous. In the early stages of their course previously to the occur-rence of inflammation which mats them together,

and restricts their mobility in relation to one another, tuberculous glands may be mistaken for lymphadenoma. The family history of tuberculous lesions may in this case also facilitate the diagnosis. The characteristic blood changes which occur in Hodgkin's disease, together with enlargement of the spleen or liver, would, if present, point to the lymphadenomatous nature of the glandular enlargement. Time would certainly resolve all doubt, for lymphadenomatous glands remain discrete, and enlarge to a size which tuberculous ones do not attain without softening and becoming matted together.

At a later stage the diagnosis of tuberculous glands presents no difficulty, for one or more of them are sure to feel soft, owing to caseation and liquefaction of the tuberculous growth having occurred. Slight attacks of inflammation of the affected glands are common. The glands often enlarge and become tender in association with a sore throat or some other inflammation. They may return to their previous size after the subsidence of the exciting cause of their enlargement, or they may suppurate. The skin over them in the latter case becomes inflamed, thinned, and eventually perforated. Pus and caseous débris escape. When the affected gland is superficial, no particular harm results from this beyond the establishment of a discharging sinus, which cannot be got to heal soundly without surgical interference, and beyond increasing the difficulties of surgical treatment, leading to unnecessary scarring of the skin ; but when the affected gland is deeply placed in the neck, or in the thoracic or abdominal cavities, its caseation and liquefaction may lead to serious complications. Several cases of sudden death from tuberculous glands discharging into the trachea have been recorded. In a case which was under my care the pus and caseous matter burst from a cervical gland, and escaped behind the pharynx, where it gave rise to a swelling of sufficient size to seriously interfere with deglutition and respiration. There were other tuberculous glands in the anterior triangle lying on the carotid vessels. After removing these the abscess was opened and drained, and the child made a good recovery. If its treatment had been delayed it might have burst into the pharynx, and the pus and caseous débris might have entered the larynx. A thoracic gland may cause fatal asphyxia by bursting

into the trachea. In some cases the caseous débris has been coughed up, and complete recovery has taken place. An abdominal gland may by bursting into the peritoneal cavity set up a suppurative or tuberculous peritonitis.

In the early stages of chronic enlargement of lymphatic glands, at a period when it is still doubtful whether they are tuberculous, suitable treatment may lead to their disappearance. The importance of removing the exciting causes of simple inflammatory enlargement cannot be too strongly insisted upon. Enlarged and unhealthy tonsils should be excised, post-nasal adenoid growths should be removed, otitis media should be efficiently treated, and every other source of irritation in the regions corresponding with the diseased lymphatic glands should be as far as possible removed.

In the early stages of tuberculous disease of lymphatic glands, benefit and possibly recovery may result from residence by the sea. The climate of Margate appears to be especially beneficial. The child should be out in the fresh air as much as possible when the weather is favorable. Tonics, such as cod-liver oil, maltine, and iron, should be given. I do not approve of rubbing ointments into the skin. I have never seen them do any good, and in several cases the friction and the irritation of the skin has appeared to be actually harmful.

If, in spite of treatment on the lines just indicated, the glands increase in size, surgical treatment will be required. If the glands show any tendency to soften, or if they are subject to attacks of inflammation, operative treatment should not be delayed, for delay will not only increase the difficulties of removal, but it is likely to lead to disfiguring scars owing to implication of the skin.

The operative measures necessary for the removal of tuberculous lymphatic glands may now be considered. The glands are usually in one or other of three conditions. (a) The superficial tissues may be healthy, and the glands may be firm and movable, or but slightly adherent to one another. (b) The superficial tissues may be healthy, but the glands may be matted together, and one or more of them may have softened. The caseation is generally, so far as my observations go, most marked in the superficial glands.

(*c*) There may be a subcutaneous abscess. The skin covering it may be healthy, or it may be thinned, stretched, and have a bluish-red tint.

The first of these three conditions is the most favorable for operation. If the skin is healthy a firm linear scar may be secured, and if the glands are movable one on another, and not adherent to the deeper structures, they may be removed safely through a relatively small wound. The operation will be considered with respect to the two groups of glands which are most frequently diseased, viz. the submaxillary group and that which lies over the carotid sheath beneath and along the anterior border of the sterno-mastoid muscle. In both cases a small hard pillow or a sand-bag should be placed beneath the child's shoulders, so that its head may hang a little backwards with its face turned to the opposite side. In operating on the first group the incision should be made about midway between the symphysis and the angle of the lower jaw, and at such a level that after the wound is healed the scar will be just beneath the jaw. The incision for removal of the second group should lie over the diseased glands and along the anterior border of the sterno-mastoid muscle. The length of the incision will be determined by the size of the glands and their depth from the surface. When the diseased glands are situated immediately over the carotid sheath, a longer incision will be required for their safe removal than when they are more superficially placed. The superficial tissues, the platysma and the deep fascia having been divided, the capsule of the most superficial gland should be thoroughly exposed. The gland may then be readily freed from the surrounding tissues by a few touches of the knife, which should always be directed towards the gland. As soon as one end of the gland is isolated that end should be raised up, and then the dissection can be continued safely on its deep surface. The point of the knife should never be lost sight of. A blunt-pointed curved periosteal elevator is a very useful instrument for isolating, and as it were digging out freely movable glands. The remaining glands should be successively exposed and removed in the manner just indicated. Very cautious dissection is required for the safe removal of the deep glands, for they lie in very close contact with the internal jugular vein, and during inspiration, when the vein is collapsed, it is very difficult to distinguish it from the surrounding areolar tissue.

The removal of the submaxillary group of glands is simple enough. No very important structures are encountered during the operation. There is, however, one small branch of nerve which should if possible be avoided. The supra-maxillary branch of the facial nerve, which supplies the depressor anguli oris and depressor labii inferioris muscles, courses beneath the angle of the jaw and in the posterior part of the submaxillary region before it reaches its supra-maxillary position. It is very annoying to find an otherwise successful operation complicated by paralysis of one side of the lower lip, though the annoyance is considerably modified by knowing that the paralysis always passes off. I have several times had the misfortune to divide this nerve, but in the course of a few weeks the lip has always regained its power. In order to avoid the nerve the incision should not encroach on the posterior third of the submaxillary space. If the gland to be removed is situated beneath the angle of the jaw, the best way to avoid the nerve is to make the incision over the lower border of the gland, to expose its capsule thoroughly, and to shell it out from beneath the tissues in which the nerve lies.

When the glands are freely movable it is often possible to remove several through a very small incision,—indeed, through an incision of no greater length than is absolutely necessary for the largest gland to pass through. The finger is inserted into the wound, and the gland felt. A pair of pressure forceps is then introduced by the side of the finger and passed down to the gland. The tissue covering the latter is then seized by the forceps and pulled up to the surface. It is incised, and the gland is exposed. The gland may then be isolated, and raised from its bed with a curved periosteal elevator. If a gland lies too far away from the wound to be brought to the surface in this way, the areolar tissue over it may be torn through with a director guided by the finger, and then the gland may be dug out with a curved periosteal elevator. I have many times removed glands in this way through incisions of no greater length than would have been required for the extraction of a single gland. In one of the cases dealt with in this way both the submaxillary and carotid glands were diseased. An incision about an inch and a half

in length was made a little below the middle of the body of the lower jaw. In all twelve glands were removed. One was situated just beneath the symphysis menti, others below the body and the angle of the jaw, and others over the carotid sheath. Notwithstanding the undermining of tissues which was necessary for the removal of so many and so widely separated glands through a single small incision, the wound healed by first intention without drainage, and the resulting scar was so hidden beneath the body of the jaw that it was hardly visible.

It would be quite unjustifiable to attempt the removal of glands in this way if they had been inflamed and were adherent to one another, and to the surrounding tissues. The jugular vein would be exposed to great risk of laceration, unless the incision were of sufficient length to display all the tissues involved by the operation. When the glands have caseated throughout and softened into a pultaceous mass, it is generally safer to scrape away the diseased tissues than to attempt to dissect them out in the fibrous capsule which surrounds them, and which is often intimately adherent to the deeper structures,—such, for instance, as the carotid sheath. But if the softened gland is not in immediate contact with any important structure, it may be removed entire by patient and cautious dissection. All possibility of infection of the wound will then be avoided, and that is a result worth the expenditure of a good deal of time and trouble. Sometimes only one of several caseous glands has softened and formed an abscess. After the abscess has been opened freely, scraped with sharp spoon, and scrubbed clear with sponges, the other glands may be successively exposed and dissected out. The softened gland is usually the most superficial one, but the opposite condition of affairs is not altogether exceptional. In a case already referred to there was a large elastic swelling behind the pharynx, and there were several enlarged glands situated over the carotid sheath. After removing them the carotid artery and internal jugular vein were exposed at the bottom of the wound. They were separated by an elastic swelling, between which and that behind the pharynx fluctuation could be obtained. A longitudinal incision was made into the swelling between the artery and vein, and caseous débris and pus were evacuated. The

retro-pharyngeal abscess cavity was scraped with a sharp spoon, and scrubbed thoroughly clean with sponges. It was drained with a tube. The patient made a good recovery. When several glands have softened it is often possible, as suggested by Mr. Teale, to scrape them away through a single incision. In such cases the glands are matted together and fused into a composite mass by chronic periadenitis, and their relations to one another correspond to those of the several cavities of a multilocular cyst. After the most superficial gland has been scraped away, incisions may be successively made through its capsule into the adjacent softened glands, which may in turn be removed with the sharp spoon. If any of the glands have not softened they may be removed entire through the same wound after every trace of tuberculous débris has been removed from it.

A gland situated immediately beneath the deep fascia may, after suppurating, become adherent to the deep fascia, and the pus may perforate the latter by a minute opening, and give rise to an abscess in the subcutaneous tissue. Such cases usually come under observation in one or other of three conditions. There may be a fluctuating swelling covered by healthy or by thin purplish-red skin, or there may be a sinus surrounded by thin discoloured and undermined skin. A more deeply placed firm swelling can generally be detected by careful examination. In order to cure these cases it is necessary to have a clear appreciation of the mode of origin of the abscess, for otherwise the source of the suppuration would most probably be overlooked, and reinfection of the abscess would inevitably take place. The cause of the abscess, which is situated in the superficial tissue, is a gland which lies beneath the deep fascia. An operation limited to the superficial abscess is insufficient. The abscess cavity is quickly reinfected, and the disease continues. If the skin is healthy the abscess should be opened by an incision of sufficient length to display the whole of its interior. If the skin is thinned and discoloured, it should be cut away. The abscess cavity should then be thoroughly scraped and scrubbed out. At some spot or other a tiny yellow point which has escaped the cleansing process will be detected. This marks the orifice of a sinus which leads to the gland in which the primary focus of disease is located.

This orifice should be dilated, or if necessary enlarged by incision, and the subfascial tuberculous focus should be scraped away. Sometimes a swelling still remains. This is due to the rest of the tuberculous gland, which had only softened and suppurated at one point. In such a case the fascia should be incised, and the entire gland should be removed.

The way in which the wound made for the removal of tuberculous glands should be treated depends on the condition of the glands. If suppuration has not occurred, and if the glands have been removed entire in their capsules, the wound will be perfectly healthy. In that case, after the bleeding has been stopped, the wound should be packed with sterilised wool swabs, and the sutures should be inserted. The swabs should then be removed, and the sutures should be quickly tied. A drainage-tube is unnecessary, but any blood which has oozed into the wound should be squeezed out immediately before the dressing is put on. If suppuration has occurred, the wound should be thoroughly disinfected and treated in the way just described; but I think it wise in such a case to drain the wound with a tube for forty-eight hours, or until it is evident that suppuration is not going to continue. The same remark applies to cases where several glands have been scraped away through a small incision. When a larger incision has been made, and when it has been seen that the wound is thoroughly clean, and that all oozing of blood has ceased, the wound may be completely closed. It sometimes happens that serum accumulates in the closed wound, but if it is let out at the first dressing it rarely interferes with healing by first intention. When a good deal of diseased skin has been removed the wound can generally be closed if the adhesions between the skin and the deep fascia are divided. But if the wound cannot be completely closed, the resulting scar will nevertheless be far less unsightly than it would have been if the thinned and unhealthy skin had been left.

When the glands have been removed entire, there is no advantage to be derived from dusting the wound with iodoform; but when the glands have softened, and tuberculous débris has escaped into the wound, I think it is beneficial to smear it with iodoform, which should be sterilised by boiling. When the interior of the wound has an irregular shape owing to the presence of several pockets, and particularly when the latter are surrounded by dense cicatricial tissue, it may be impossible to insure accurate apposition of the sides of the wound by external pressure. In such cases it is a good plan to pack the wound with iodoform gauze, in order to prevent inflammatory exudations being pent up in the pockets.

As in all cases of interference with tuberculous foci which cannot be absolutely eradicated, there is a possible though fortunately only a remote risk of general tuberculous infection being set up by the escape of softened caseous débris into the fresh wound. Another possible complication is secondary hæmorrhage from the internal jugular vein. I have on several occasions, in the course of the removal of tuberculous cervical glands, been obliged to ligature the internal jugular vein. Secondary hæmorrhage has never occurred in these cases. Very frequently the vein lies exposed for a considerable distance at the bottom of the wound. If the child vomits or strains in any way the vein becomes so tensely distended that it looks in danger of bursting. This accident actually happened in one of my cases. The operation was completed satisfactorily, and nothing occurred to draw attention to the wound until the seventh day, when the dressing was changed. The house surgeon noticed that the wound was distended. He took out a stitch and opened the wound, whereupon a furious gush of venous blood took place. This was temporarily arrested by plugging the wound. I removed the plugs and inserted two fingers into the wound. The bleeding was readily checked by pressing on the vein above and below the rent. The vein on either side of the rent was then clamped with pressure forceps and ligatured. No further bleeding occurred. The wound was free from inflammation, and the vein looked just as though it had been recently exposed; its walls were not thickened, and it was not at all thrombosed. The rent, which was about half an inch long, looked as though it had resulted from rupture without any inflammatory softening of the vascular wall. In another case, which was under the care of a colleague, the glands had suppurated, and the internal jugular was freely laid bare in their removal. A few days after the operation the wall of the vein sloughed and fatal hæmorrhage ensued.

Surgical help is often required for the removal of the deformity caused by ugly and depresssed scars left by tuberculous abscesses which have discharged spontaneously, and after prolonged suppuration have healed. Sometimes the tissues are healthy, but the skin is puckered and drawn in by a band of cicatricial tissue. In such cases it may be possible to divide the cicatricial band subcutaneously and so release the skin, which may then be drawn to its proper level be means of straps of rubbed plaster. The skin should be moved daily for about ten days in order to prevent fresh adhesions taking place. In other cases the scar is disfiguring owing to the presence of tags and bridges of unhealthy skin. This condition results from cicatrisation of an irregular wound, in the neighbourhood of which the skin has become thinned and undermined, but only partially destroyed. If the affected skin can be completely excised, and the resulting wound can be closed without causing undue traction on surrounding parts, it should be excised. Very pleasing results can often be obtained in this way. If the scar is too big for complete excision, its appearance may be greatly improved by cutting away the tags and bridges of skin, and by scraping away such parts as are still diseased.

WITH MR. JOHN HOPKINS, F.R.C.S.,

IN THE

WARDS OF THE CENTRAL LONDON SICK ASYLUM.

LADIES AND GENTLEMEN,—The patient before you is 86 years of age, and he has been in the hospital two or three times during the last two years. Two years ago he came in with a strangulated hernia. We were unable to reduce it, so he was prepared for operation and anæsthetised, when the bowel was reduced by taxis. It was a large hernia, and it was subsequently found difficult to keep it up by mechanical means. He could not be relied upon to render help, as he was apt to forget what he had been told to avoid doing. After returning once or twice with the hernia strangulated again, it was decided to keep him in, as there would probably come a time when it would lead to serious results. The strangulation having recurred again and again, it was decided to put him out of further danger by a radical operation, which he has come through very well. You can feel the ridge formed by the drawing together of the pillars of the ring. McEwen's operation was performed fairly completely. McEwen's needles, which you see here, are in pairs, for threading right and left, and as they are blunt-pointed there is no danger of wounding the epigastric artery. The neck of the sac was cut through, then tied, and the thread was passed backwards and forwards through the tube as far as the internal opening; then the upper end of the thread was passed through the abdominal wall away from the epigastric artery, and the whole of the upper part of the tube pulled up, so that it lay puckered under the internal ring. Three stitches were afterwards put in to draw the pillars together. It was a large old hernia; the peritoneum was very adherent, and when an attempt was made to separate the peritoneal sac it promised to be a long and tedious process; so it was left *in situ*, and in a patient at 86 it could not be of much moment. You see there is not much difference in size between the sides of the scrotum. One of the patient's parents is reputed to have lived to the age of 108.

You will remember that you saw this next patient on May 7th. He had been the subject of perforating ulcer on the sole of his right foot. Some time afterwards he felt he was well enough to go out; but he has come back, as I said he would, with the corn open and his foot inflamed. You can see in the centre a projecting mass of granulation tissue, which rises from the floor of the bursa. The probe passes beneath this ring of thickened epidermis a considerable distance all round, and at one spot goes in deeply; but there is not any carious bone to be felt. On the other foot you will remember a corn was seen to be blood-stained in its deeper layers; now the fluid of the underlying bursa has penetrated laterally through the softer epidermis which lies next the true skin, and is on the point of bursting. On cutting out a corn you see the thick mass of epidermis removed is ragged on its under surface, and there is a small circular area, the floor of the bursa, devoid of epidermis.

People who suffer from degeneration of nerves

are very liable to attacks of erysipelas, or rather to attacks of erysipelatous inflammation. The word erysipelas is commonly used to designate a great variety of diffuse inflammations. There come into this institution in the course of a year at least fifty cases of this disease, very varied in character. True erysipelas has been fairly well defined. The *Coccus erysipelatosus* has been cultivated, and pure cultivations of it have been inoculated with a view to dispersing malignant tumours. It has been stated that sarcomata do sometimes markedly diminish, if not disappear, under an attack of erysipelas. This fact afforded an opportunity of studying cases of pure erysipelas in the human subject, and it was found that the duration was seven or eight days, that there was no suppuration, and there was a typical rash with a spreading defined border. Erysipelas, as met with in practice, is not by any means limited to the period I have mentioned, but may last three or four weeks, the rash sometimes spreading continuously from point of origin in face or limbs to the middle of the back or farther. The farthest I have seen it extend was from the face to the middle of the thighs, which it reached in three weeks. There seems no good reason why it should not spread until it has travelled over the whole body. True erysipelas will sometimes cause suppuration. One may find it travel, without causing suppuration, from the face as far as the elbow, but there set up suppuration in the bursa over the olecranon, though nowhere else. One such case I have seen in which the patient had a miner's elbow.

I have said that the forms of diffuse inflammation vary very much. There may be the very slightest erythema without any defined border, and with very little swelling; on the other hand, there may be acute moist gangrene, and every variety may be encountered between these extremes. Sometimes there is little or no œdema, sometimes much; there may be sloughing of the skin and cellular tissue, or suppuration may occur without any obvious slough. The sloughs may be black. The worst forms I have seen were those in which the sloughs were black, and in each case the disease began in the perinæum and spread very rapidly. Around a black sloughing patch of skin was a dusky red inflammation, with much inflammatory œdema, while extending a long way beyond was emphysematous crepitus under the skin. Wherever this crackling extended there was a slough in a few hours, and wherever an incision was made the cellular tissue was found black and separating. It was impossible to overtake any such erysipelas as that by any treatment, and the inflammation extended in the cellular tissues as far as the axilla in both cases. In one case the patient survived long enough for the sloughs to come away through incisions as far as the axilla. Sometimes a case of sloughing cellulitis is admitted, in which there is already some gangrene of the skin; generally there is much swelling and redness, and perhaps a blister, beneath which will be found a little patch of gangrene. On seeing such a case one may always feel certain that there is very extensive sloughing of the tissues beneath, so that the surgeon should be very prompt in letting out all inflammatory effusions and draining the part thoroughly, so as to check any further diffusion of the inflammatory products. But a case came in here a few weeks ago, which you will see presently, in which there was no inflammation of the skin at all; there was only moderate œdema of both legs and feet, and on the left leg and foot were three blisters containing sanguineous serum. On snipping through these blisters, gangrenous skin was seen beneath; this was incised and cut out with a pair of scissors. It was then found that the cellular tissues were sloughing, the process extending a considerable distance—in fact, the greater part of the subcutaneous cellular tissues of the lower two-thirds of the leg and foot were involved. One looks on active inflammation as a means of preventing the diffusion of micro-organisms through the tissues; therefore when I saw this case, in which there was very little evidence of inflammation, but extensive sloughing, I looked upon it as hopeless, believing that the woman had a constitution so undermined that her tissues had little or no power of resistance. I am happy to say, however, that on removing the portions of gangrenous skin, and freely separating the sound skin from the deeper parts by passing forceps here and there from the openings made, the spread of the gangrenous cellulitis at once ceased, and in a short time it was obvious she would recover. Notwithstanding their variety, all these cases practically come under the name of erysipelas. Very often there is added an inflammation of the lymphatics. It is a common occurrence for a patient to come in with a sore toe, and some

inflammation at the back of the foot; extending from this red lines are found on the inside of the leg and thigh, and one or more red patches may come out at any point as high as the middle of the thigh, which may have a well-defined and spreading border; in fact, it proves to be a case of true erysipelas. One never knows when the erysipelas coccus is there, and really it is a matter of indifference whether it is there or not, because it is probably not more harmful than the other micro-organisms which cause diffuse inflammation.

The question of infection in erysipelas is a very interesting one. Many authors have maintained, and I think it has generally been maintained in England, that erysipelas is of the nature of an infectious fever. But I have never seen erysipelas conveyed from one patient to another, no doubt because of the ordinary care which is exercised in hospitals in the use of antiseptics. Erysipelas infection is not to be dreaded in the least if only the wounds are dressed antiseptically, and such may be placed with other surgical cases without risk.

A common contributory cause of erysipelas, apart from wounds, is cold. If a face has been covered up during an attack of erysipelas, and is then afterwards incautiously uncovered and exposed to a draught, the disease is apt to return. Cases have been recorded in which patients have had repeated attacks of erysipelas from exposure to draughts. About two years ago two cases occurred here which illustrated very clearly the effects of chill. The winter had been very mild, and the windows were opened at the top for free ventilation. One night it suddenly became intensely cold, and it is probable that was the exciting cause of erysipelas in those two men, who occupied corresponding beds on the south side of wards 2 and 3. In both of them erysipelas commenced at the tip of the nose the next day. Both were very feeble, and one may assume they had a small sore just within the tip of the nose, a condition commonly enough encountered in persons of low vitality. Probably the microbes had been there for a long time, and until the advent of the chill the tissues had been able to resist invasion, but with the chill the micro-organisms got the advantage, and were able to gain access to the lymphatics, multiply, and spread. One sees the result of failing power of resistance in the tissues not only in cases of peri-

pheral nerve degeneration, such as I described in a former lecture, but it is not uncommon to see it in dementia. I remember one old woman who used to be sent here regularly every three or six months for a few years on account of erysipelas of the face; finally she remained in here permanently, became bedridden and incapable of doing anything. From that time her erysipelas ceased, and it is easy to suppose that while about she was exposed to chill, but not when in bed. There is also the explanation that when persons' minds become enfeebled they do not observe ordinary cleanliness, and are therefore all the more likely to expose themselves to fresh contagion. However it may be, probably the woman's tissues had diminished power of resistance, with the result that under circumstances favorable to its development erysipelas frequently attacked her.

It has been said that these cases of recurrent erysipelas are due, not necessarily to a fresh invasion by the micro-organisms, but to the fact that they lie latent in the tissues; and I believe Mr. Hutchinson has held this view for many years. It seems to have been proved that the micro-organisms of typhoid fever will lie latent in the bones months after the patient has recovered. Still in a number of cases there is a fresh invasion each time. It may come from deeper parts — mucous membrane, and so on. Erysipelas will show itself repeatedly upon the bridge of the nose or the cheek, directly from some trouble in the nares or antrum. It sometimes spreads in the mucous membrane and appears at the external nares, but this is rarely seen.

Sloughing of the cellular tissue and of the skin is seen here most commonly in the lower limbs. Where it is especially to be dreaded, though it does not frequently occur, is in the tissues of the lids and orbit. There is no more dangerous condition than sloughing of the cellular tissue of the orbit. If the inflammation fails to set up any distinct sloughing, there may be simple suppuration. There is an acute suppuration which takes place at the onset of the disease, and after the inflammation has in great part subsided there is quite commonly some offending matter in the tissues, which causes what is known as a residual abscess. These residual abscesses are very common, but as a rule patients do not complain

of them ; and the abscess may become of considerable size without there arising any suspicion of its presence, unless the part be regularly examined.

One, as a rule, need not be in any fear of a case of erysipelas leading to a fatal result as long as there is no suppuration or sloughing. In erysipelas of the face, the orbit, as I have said, is liable to manifest sloughing, and this is really the only point about which there need be much fear. If the affection passes away from the orbit the patient will almost certainly get well. If the skin is very tense and shining, one should not wait till gangrene threatens in the lids, because if the slightest sign of gangrene of the skin of the upper lid be present extensive sloughing will already have taken place in the cellular tissue. If the lids are very tense, make an incision, because an early incision will probably very much modify the severity of the process. If no sloughing tissue is found beneath, you will be safe in concluding you have prevented that stage by early interference. On the other hand, if there be already threatening gangrene of the skin you will find the cellular tissue sloughing, and however deeply you dissect you will generally fail to reach the bottom of the slough. In such a case there can be little hope of a favorable end. At the autopsy it is found that the inflammation has not penetrated to the meninges. The real cause of death in these cases seems to be the impossibility of draining the orbit properly, owing possibly to the many layers of cellular tissue which confine the inflammatory products, and thus lead to septicæmia or sapræmia.

Regarding suppuration and sloughing in the limbs, it is to be dreaded in proportion to the inflammatory œdema. If there be much œdema it is advisable to make an incision, but it is only necessary to open where abscesses are threatening. One may know when pus is forming without seeking for fluctuation ; the skin is of course tender wherever it is inflamed, but the pain is not similar in intensity to that produced by a collection of pus or inflammatory products on the point of suppuration. When the subcutaneous tissues have sloughed, and the skin is already gangrenous, one should cut out the gangrene, and with forceps separate the skin from the deeper fascia, passing the forceps if need be to the hilt. Sometimes incisions also are necessary, but the opening made by

removal of the gangrenous skin, together with the free separation effected by forceps, will often be sufficient to arrest any further spread of the inflammation.

As to internal medication, it is very difficult to judge what effect a particular drug has : personally I always come back to the perchloride of iron in large doses--half a drachm or 40 minims every four hours. This has seemed from time to time to arrest the disease, and promote a rapid return to health.

Then as to external applications. In all cases of diffuse inflammation one should avoid applying anything that precludes the opportunity of judging of the progress of the case. Flour, paint, and similar substances which cover in the parts do more harm than good by concealing the condition. The application invariably used here in such cases is a warm moist one. A lint mask for the face, covered with waterproof material and cotton wool, is put on ; then progress can be noted each time the mask is removed. In erysipelas of the face it is of the greatest importance to break all blisters as soon as they form, to squeeze out all suppurating follicles, and it is a good plan to scrape the skin wherever the epidermis is raised by effusion with the back of a curved bistoury ; this breaks the blisters, removes the peeling epidermis, empties the suppurating contents of the sebaceous glands, which add fuel to the fire, and in a short time produces marked improvement. The œdema subsides, and there is left a simple spreading, diffuse inflammation of the skin, which pursues its usual course.

In regard to the extremities after the removal of gangrenous skin, and making the necessary incisions to ensure free drainage, put the patient's limb into an antiseptic bath. I show you one for the leg, which was constructed to order ; you will see it is narrower than the ordinary bath, which takes too large a quantity of liquid to be economical or convenient. The bath is placed close to the side of the bed, so that the patient can immerse the limb up to the middle of the thigh, even all day if thought necessary, the contents being periodically renewed. A creolin or detergent bath is the best and cheapest. No bad result ensues from the hanging down of the limb. The disadvantages are more than compensated for by insuring a thoroughly antiseptic treatment of

the part. If drainage-tubes are avoided, healing is rapid when once sloughs are removed.

This female patient is the one mentioned as having gangrene of cellular tissues without inflammation of the skin. Her face indicates advanced cirrhosis of the liver, and no doubt her health was very considerably undermined beforehand. In one place there was a residual abscess. Two or three weeks after the whole part was apparently free from the contagium, a soft fluctuating spot was found, and this illustrates how long after the primary inflammation has subsided these little abscesses will appear.

I next show you a woman who is the subject of chronic œdema, a not infrequent result of erysipelas. Where there is an old chronic ulcer, which has penetrated very deeply, and is causing ulceration of the muscular and may be periosteal tissues, there is always great likelihood of the patient having attacks of erysipelas from time to time. This spreads upwards and downwards to the toes and to the knee, the lymphatics become blocked, and chronic œdema results.

This patient, a male, illustrates the same condition. The lower third of the leg is surrounded by a cicatrix, except at one spot not yet healed. The foot, as you see, is enormously hypertrophied from recurrent inflammation. The skin of the ankle and dorsum is irregularly thickened and nodular. This irregularity of the hypertrophied skin is due in part to the discharges soddening the epidermis, which accumulates, and together with the drying pus forms crusts, beneath which the papillæ hypertrophy. An attempt to scrape off the firmly adherent crusts draws blood from numbers of the papillæ that have been broken across. The soddened epidermis may be in part removed by scrubbing with liquor potassæ, when the papillæ will be exposed, forming a rough pile as in ichthyosis. These papillæ atrophy when the part is kept clean and dry, but leave the skin irregularly thickened as you see in this case. Where there has been so much loss of tissue through long-standing ulceration the final healing of the sore is often tedious, and much time is still further needed to obtain a firm cicatrix, and to render it supple enough to insure its keeping sound when the patient gets about again. But it is very few ulcers that cannot be ultimately healed, and the scar consolidated so as to render it probable that with care the ulcer will not form again. But the scar needs careful treatment and close watching. Keep the cicatrix free from scales, and do not let it become eczematous, but harden it with methylated spirit every day. Massage, too, is a very useful aid. Most of our patients will probably come back after they have been out for a time, but with proper care on their part this could often be avoided.

A CLINICAL LECTURE

ON

PERIPHERAL NEURITIS.

Delivered at the Hospital for Diseases of the Nervous System, Welbeck Street,

By HARRY CAMPBELL, M.D.,

Physician to the Hospital.

GENTLEMEN,—The subject of this afternoon's lecture is peripheral neuritis, a disease which has only been investigated within recent years. Ten years ago one scarcely ever heard the name. Nevertheless cases of it were gravely diagnosed by learned neurologists, being generally attributed to polymyelitis.

In order to understand this disease, it will be well to consider the structure of an ordinary mixed spinal nerve. Such a nerve consists first of all of motor and sensory fibres, and these latter are of several varieties; for instance, there are special fibres for the sensations of touch, heat, cold, and pain respectively; there is no doubt that all these sensations have special nervous mechanisms. The mixed trunk also contains vaso-motor and secretory fibres. There is no doubt regarding the existence of the latter; thus the cutaneous glands are under the direct and immediate control of secretory nerves, quite independently of their vaso-motor supply. There may also be, but this is improbable, special trophic fibres, that is to say fibres whose special function it is to govern the nutrition of the tissues.

Let us now consider the structure and origin of the individual nerve-fibres. Each fibre has in its centre an axis-cylinder, which is its conducting portion; this is enveloped in the myelin sheath; outside this, again, is the neurilemma. This latter

comes at regular intervals into contact with the axis-cylinder, thus dividing the fibre into a number of segments or "internodes." Each internode is provided with a nucleus, which lies, embedded in protoplasm, immediately under the neurilemma. Hence an ordinary medullated nerve-fibre consists of axis-cylinder, medullary sheath, neurilemma and nerve nuclei. The individual fibres constituting a nerve trunk are united together by interstitial tissue, the nerve trunk being surrounded by a fibrous sheath.

Now as to the origin of the nerve-fibres. Every nerve-fibre originates in a ganglion-cell, constituting with it a so-called *neuron*. The ganglion-cells from which the spinal motor fibres originate are situated in the anterior grey horns of the cord ; the sensory fibres taking their origin in the cells constituting the ganglionic swellings of the posterior nerve-roots. So that you see whereas in the case of the motor fibres the impulses pass from the ganglion down towards the periphery, in the sensory fibres they pass up towards the ganglion. As you all know, the nutrition of nerve-fibres is dependent upon the cells from which they arise, the ganglion-cell controlling the entire neuron. You know that if the governing cell is destroyed, or if the fibre is severed, the latter, thus bereft of the influence of the parent cell, of which it is a mere prolongation, degenerates.

Let us study the nature of this degeneration. It is not, as one might anticipate, a mere passive process or atrophy ; it is, on the contrary, an active process. The first thing that happens after dividing a mixed nerve trunk is an increase in the protoplasm surrounding the nuclei, in consequence of which it gradually encroaches upon the myelin sheath. The nuclei then multiply, so that after a time there may be four or five nuclei in each internode, in place of the single one. The protoplasm and nuclei thus encroaching upon the myelin sheath and axis-cylinder, sever them in places—in other words the fibre becomes segmented, and it then loses its power of conducting impulses. After a time the contents of the fibre are removed, when it becomes a mere husk of its former self—a shrivelled-up envelope devoid of all contents. While these processes are going on, leucocytes and nuclei are frequently observed outside the fibre, showing that the nutritive changes are not confined to it.

Much the same changes as those just described take place in *parenchymatous* neuritis, *i. e.* the form which starts in the fibres themselves. There are two other kinds of neuritis, that which affects the sheath chiefly (*perineuritis*), and that which involves the interstitial tissue mainly (*interstitial neuritis*).

Let us now deal with the causes of neuritis. They may be local or general—due, namely, to a general blood state. The most common local cause is cold ; facial.paralysis is often thus induced. How it acts in such cases it is difficult to say, perhaps by locally reducing vitality, and opening the way to the action of a toxin. Another local cause is injury, such as a fracture, dislocation, or bruising. Again, the spread of inflammation from surrounding parts, as in suppuration, may act locally. Then compression, as from a tumour, or even the mere weight of the body, may set up a local neuritis in one who is predisposed to it. It is not rare for people to wake up in the night with a sense of numbness and weakness or even actual paralysis in a limb. Generally these symptoms pass off shortly, but they may continue, from the supervention of genuine neuritis. I have noticed that the tendency to experience sensations of tingling and numbness in the arm or leg from lying upon it is much greater at some times than others, and I have little doubt this is due to the peculiar condition of the blood at those times ; very probably a toxin is present which, in conjunction with the compression, initiates changes in the nerve-fibres akin to those which take place in the first stage of neuritis. I believe that many of the unpleasant sensations which are felt in the extremities, such, for instance, as "the fidgets," are due to the irritation of the peripheral nerves by toxins. Another local cause of neuritis is leprosy, the nerve trunk being in this disease invaded by special micro-organisms. Perineuritis and interstitial neuritis may also be caused by gout and syphilis. Cancer, again, may invade a nerve trunk ; so may the morbid tissue of leucocythæmia.

So much for the local causation of neuritis. The great *general* cause is blood-poisoning, and the peculiarity of the neuritis thus resulting is its multiplicity and symmetry. It is evident that the poisons which act in this way have special affinities for special nerve-fibres. This statement may at first seem a little far-fetched ; but if we consider that curare picks out and paralyses the motor nerve terminations, and that atropine has a selective

action on certain ocular nerves, we shall the more readily believe that other substances, such as alcohol and lead, may have a similar selective action. Now what are the poisons which produce this *polyneuritis*, as peripheral neuritis is sometimes termed? Before answering this question let me emphasise the fact that the fibres are affected especially at their periphery—at the part most removed from the governing ganglion cell, and where, it has been suggested, nutritional energy is feeblest.

We may divide the poisons producing neuritis into (*a*) metallic and (*b*) organic. Among the former are lead, arsenic, silver—the most common being, of course, lead. Of the organic poisons the first I shall mention is that which is formed in diabetes. Multiple neuritis occurs in diabetes, though somewhat rarely in a well-developed form. In most cases of diabetes, however, the knee-jerk is lost at an early stage, and this indicates some nerve change. Then we come to alcohol, which is *the* great cause of multiple neuritis. It is an interesting fact that the various micro-organisms which produce multiple neuritis do so by means of the chemical substances which they produce, and that alcohol is itself the product of a micro-organism. Alcohol is much more apt to produce peripheral neuritis in women than in men. I do not think there is any strength in the view which attributes this preponderance to women taking less active exercise than men, and thus not working off the poison so rapidly. It is probably due to differences in the nervous organisation of the two sexes, for while women seem to suffer most from the effects of alcohol in the nerves, in men the brain would appear to suffer most. Indeed, men are more liable than women to all forms of organic brain disease. Another poison causing polyneuritis is that evolved in diphtheria. Again, in typhoid, typhus, and smallpox, and probably other of the exanthemata, poisons capable of producing neuritis are produced. Influenza may cause almost anything, and it is a potent cause of peripheral neuritis. In beri-beri, again, a poison capable of acting similarly is evolved. Septicæmia is a recognised cause. Multiple neuritis is sometimes observed after wounds, and has been known to occur after exposure to the smell of bad drains. It is, indeed, quite possible that peripheral neuritis occurring without obvious cause is often due to some germ not yet identified. Cold may also act as a general cause. We know that pneumonia is due to a micro-organism, just as rheumatic fever probably is, and that both may be excited by cold. Its effect in these cases must be to diminish the resisting power of the body to pathogenic germs. Syphilis may act as a local and general cause of neuritis. Thus a gumma may form about a nerve (one of the cerebral nerves, for instance), or the blood may be contaminated with a toxin which has a special affinity for the nerves.

All the general causes I have mentioned induce parenchymatous neuritis.

Let us now consider the symptoms of multiple neuritis. They may be considered under the heads of sensory, motor, and trophic.

First as to sensory symptoms. It is an interesting fact that when a mixed nerve trunk is affected with sufficient severity to produce motor paralysis there may be but little loss of sensation. The motor fibres seem to be much more liable to be attacked than the sensory. A very salient feature of neuritis, whether isolated or multiple, is pain and tenderness of the nerve trunk. In some cases the nerve trunk is swollen, so that you may be able to feel it, the patient wincing under the slightest pressure of it. I ought to have mentioned, when speaking of the anatomy of the nerve trunk, that if you stimulate a *nerve-fibre* in its course sensation is felt, not at the point stimulated, but at the periphery. On the other hand, some sensation is felt at the point where a *nerve trunk* is stimulated. The interstitial tissue of the trunk is richly supplied with nervi nervorum, which are provided with end-organs, and stimulation of these end-organs causes a sensation to be felt at the part stimulated. Those parts of the body which are devoid of sensory end-organs are insensible. It is for this reason that the brain and spinal cord may be cut without sensation being felt. On the other hand, the meninges of the cord and brain are excessively sensitive because they are very abundantly supplied with nerve terminations. It will thus be seen that a sensory nerve-fibre must be stimulated through its end-organ in order that it may best convey to the brain that peculiar form of impulse needful for the evolution of sensation.

On grasping or moving the limb in peripheral neuritis the patient experiences great pain, and

I lay particular stress upon this point. Cramps, pains in the joints, numbness, tingling, and dull rheumatoid pains, or burning pains which are worse at night, are frequent. Sometimes you may get small anæsthetic areas.

Next we will speak of the motor symptoms. There is wasting and paralysis of the affected muscles and some degree of inco-ordination. When the affection begins in the legs you may have pseudo-tabes, a condition which is sometimes difficult to diagnose from locomotor ataxia. I can recall a case in which there was loss of knee-jerks, numbness of the soles of the feet, pains, and marked inco-ordination. In the old days it would have been put down as locomotor ataxy, but inasmuch as there was some œdema and slight atrophy of one or two muscles, there could be no doubt it was a case of multiple neuritis.

The muscles of the legs are more liable to be affected in peripheral neuritis than those of the arms, and the muscles of the extremities more than those of the trunk. In the legs they are more apt to be picked out below the knee than above it. In the former case the anterior muscles are preferentially attacked (causing foot-drop); but above the knees the muscles behind are as liable to be affected as those in front. The hip muscles escape. There may be paralysis of the diaphragm and vagus, also of the eyes, face, and tongue; but this is uncommon. The affected muscles are apt to be the seat of fibrillary twitchings. Contracture of the unparalysed groups of muscles is apt to occur, causing deformities, especially if the patient remains in bed for a long time; for the legs are apt to be kept flexed, and if proper precautions be not taken permanent deformities may result.

Myotatic irritability is always lost in the affected muscles, but the knee-jerks may be preserved when the paralysis is below the knee, as in a case of alcoholic neuritis now under observation.

The trophic symptoms met with in neuritis are various. There may be glossy skin, with atrophy of the hair-follicles and of the sudoriparous and sebaceous glands; and not only may the skin thus waste, but the subcutaneous tissue also, and even the bones. More rarely ichthyosis—abnormal thickening of the skin—occurs. Alopecia and greyness are sometimes observed. There may be various eruptions, such as herpes, pemphigus, and ⁻⁻tions of the nails, which may be thickened

and brittle. Vaso-motor phenomena, in the shape of pallor, redness, and œdema, may occur. It is important to bear in mind also that a trifling heat may produce a sloughing and vesication in parts affected with peripheral neuritis. There may be effusion into joints, and in chronic peripheral neuritis you may get adhesions forming and producing ankylosis.

Now a word as to diagnosis. In my student days these cases of multiple peripheral neuritis were generally diagnosed as anterior polio-myelitis, and it is sometimes far from easy to distinguish these two diseases. In acute polio-myelitis, e. g., there may be rheumatic pains, wasting of the muscles, and the reaction of degeneration, all of which are also present in peripheral neuritis. How then do we distinguish them? The persistence of pain, the occurrence of tenderness in the limbs, and the presence of anæsthetic areas would make the diagnosis of peripheral neuritis certain. Further, this disorder is always symmetrical, whereas in polio-myelitis the muscles are often picked out at random.

We next pass to treatment. By far the commonest cause of peripheral neuritis in this country is alcohol. It is well to remember that it is often very difficult to get a reliable history of alcoholism from women, because the subterfuges they are often compelled to resort to in order to procure the alcohol make them adepts at deception. Hence their denials should be received with caution. It need scarcely be said that in all alcoholic cases the alcohol should be completely cut off, an exception only being made in those cases where there is danger of cardiac failure. As to drugs, pain is relieved by morphia and antipyrin, and by the injection of cocaine over the seat of pain. Other remedies are salicylate of soda, arsenic, and iodide of potassium. But remember that arsenic may cause peripheral neuritis. An eminent physician tells of how, being pushed for time, he diagnosed a case as one of tabes dorsalis, without testing the sensibility of the lower extremities, and prescribed arsenic. Next time the patient came his legs were found to be covered with an arsenical rash. He was actually suffering from pseudo-tabes, the result of arsenical poisoning.

When the acutely painful stage is over the paralysed muscles should be excited to activity by volition and galvanism, the weakest current capa-

ble of causing visible contraction being employed. Massage should be assiduously employed, and every precaution must be taken to avoid the contractures I spoke of.

NOTES.

Idiopathic Salivation.—Salivation may arise from a variety of causes—some local, some remote. In some instances an ætiologic factor is not obvious. Among the local causes are inflammatory processes in and about the mouth and its glandular appendages; for instance, stomatitis, glossitis, gingivitis, pharyngitis, &c. Mercurial and other forms of metallic intoxication, such as plumbism and poisoning with antimony, may likewise be placed in this category. Among the remote influences related to salivation, some of which are constitutional and others reflex, may be enumerated gastro-intestinal disorders, nausea, vomiting, gastralgia, pregnancy, suppression of menstruation, hysteria, mania, epilepsy, hydrophobia. Excessive discharge of saliva sometimes occurs as a critical manifestation in the course or at the close of attacks of pneumonia, dysentery, septic intoxication, typhoid fever. It may also take place with the disappearance of a pre-existing leucorrhœa or œdematous state. Jaborandi or its alkaloid, pilocarpine, is almost the only drug directly capable of inducing excessive salivary secretion. Finally, there is a small number of cases in which no cause for the morbid condition can be ascertained. In these the disorder is designated essential or idiopathic, but such a distinction can be considered only tentative, to be supplanted by a more accurate and distinctive one when the expansion of our knowledge shall disclose the previously hidden cause.

In a recent communication upon this subject, Jordan ('Birmingham Medical Review,' September, 1897, p. 173) has reported two interesting cases of so-called idiopathic salivation occurring in children. In one the patient was a boy 4 years old, who came under observation on account of constant dribbling of saliva from the mouth. The child's clothing for some distance below his neck was thoroughly soaked. It was stated that he had always dribbled—very much so during dentition.

The dribbling continued at night, so that the pillow was wet, but to a less extent, and the amount of saliva that escaped varied from time to time. The boy appeared quite happy, and, but for the salivation, perfectly healthy. He was said to be in good health, to eat well, and have no digestive trouble, but to be always thirsty. He used ordinary diet and was very fond of porridge. He was intelligent for his age, and talked plainly. Examination disclosed no latent mischief or defect, general or local. The mucous membrane of the mouth was healthy; the left tonsil was perhaps slightly enlarged; and of the teeth, which were cut normally, the lower premolars were already decaying. Four other children in the family were in good health, and displayed no tendency to salivation.

Three months later another boy, æt. 2½ years, presented himself, giving a history almost identical with that detailed. This child, too, had dribbled very much during dentition, which began when he was four months old, and was completed eight months later. The dribbling continued, but received little attention until the child was two years old. From this time it had grown gradually worse, although it varied in degree. The clothing was saturated. At one time the dribbling had continued through the night. The general health was said to be good except for attacks of tonsillitis. This child also had fed much on porridge. His teeth and the mucous membrane of the mouth were in a healthy state; but the tonsils, especially the left, were much hypertrophied. No other lesion of any sort was discovered on examination. The boy was intelligent, although he did not speak plainly.

The condition described appears to be a rare one. Finlayson has reported a case in which salivation appeared rather suddenly in a child at the age of six years, and Bohn has contributed an article on the subject to Gerhardt's 'Handbuch der Kinderkrankheiten,' Bd. iv, Abth. 2. The disorder may set in in early life, during dentition, and continue indefinitely thereafter. In some cases it occurs for the most part only in the erect posture, ceasing, as a rule, during sleep. It may be diminished by emotions of the most varied kind. Iron has proved of undoubted influence in the treatment; but although anæmia was present in some cases, this is not thought to be a cause of

the disorder. The affection presents some fea-
tures of a neurosis. The intermittent character of
the salivation, its subordination to psychic in-
fluences, its tendency to abate with the develop-
ment of the body or to yield to remedial drugs,
point to a peculiar and isolated affection of the
salivary-gland nerves in the developing organism
of the child. How late in life the disorder may
continue is a matter of uncertainty. The question
arises, How far may the salivation be the result of
an increased flow, and how far due to a failure to
acquire the habit of automatically swallowing the
saliva ? In the presence of hypertrophied tonsils
it is possible that as a result of difficulty in swal-
lowing there may be a failure to acquire the habit
of performing this act automatically.

<div align="center"><i>Medical Record,</i> November 6th, 1897.</div>

Poultices in Pulmonary Diseases of Chil-
dren.—This important but common subject would
not need discussion now were it not that the prin-
ciples of therapeutics, represented by the proper
use of poultices, seem to be forgotten at times or
their operations rejected. When professional men
like Senior ('Brit. Med. Journ.,' April 3rd, 1897)
and others, eminent in the domain of medicine,
object to the poultice because "it gets cold when
allowed to remain on several hours," and thus
becomes an exciting cause of further disease or a
relapse, as changing from a warm to a cold room
might, it is necessary for some one to remind these
critics of the purpose for which a poultice is used,
and the method of its application. The poultice
may be used to relieve pain, or to produce *local*
dilatation of the capillaries to relieve some con-
gested area. Now, if these are the objects sought,
this is certainly one of the agents which may be
used, especially in the pulmonary diseases of
children. The *method of use* is as important in
the employment of this remedy as in the case of
any other. It would be useless in many instances
to look for good results from the administration
of a dose of quinine once a week, or even once a
day. It is just as unwise to expect decided effects
from a poultice when used in a haphazard or
irregular way, or at great intervals. Directions
must be definite and results will be positive.

In broncho-pneumonia, pneumonia, or bron-
chitis, it is not always advisable, but is often bene-

ficial. If the patient is poor, the apartment cold,
and provisions for nursing meagre, it may be better
not to undertake the use of this agent. The
method and circumstances are everything. Under
favorable conditions—that is, under conditions
where the physician's directions can be faithfully
carried out—the poultice is of great value. When
directions cannot be fully conformed to, this agent
should not be used—a rule which applies to all
remedies.

In broncho-pneumonia, when dyspnœa is marked ;
in pneumonia, when pain is great ; in pleurisy and
bronchitis, accompanied by much distress—a hot
poultice surrounding the body will often give very
quick and permanent relief; but it must be kept
hot by frequent changing, or covering with oiled
silk and heating with hot-water bottles.

The failure to get good results from the use of
poultices indicates a failure to observe therapeutic
indications, or negligence in the method of using
the remedy. The fault, then, is not with the
poultice as a remedial agent, but with the method
of use, or with the using it when there is some
contra-indication. It is no more a panacea for all
pulmonary ailments than is Dover's powder. A
differential study of cases will help to determine
the conditions in which this remedy is of greatest
value, and will aid in restoring the poultice to its
former deservedly high place in the minds of the
profession, and conduce to a proper limitation of
its field of usefulness. Exact therapeusis requires
that a remedy be prescribed at the proper time, in
a definite manner, for a known purpose. Other
important local applications which require as
careful and scientific use are the mustard, capsi-
cum and spice poultice or plaster ; stupes of tur-
pentine, camphor, alcohol ; jackets of spongio-
piline, cotton, lamb's wool. None of these can be
applied in every case indiscriminately.

<div align="center">Dr. J. M. G. CARTER, <i>Medicine,</i> Nov., 1897.</div>

Bicycling.
—Recent investigations of the urine
of healthy subjects before and after bicycle riding,
showed in half of the cases such an abundance of
albumen and cylinders of various kinds, that the
diagnosis of acute or chronic parenchymatous ne-
phritis would certainly have been made by any
one unacquainted with the circumstances.

<div align="center"><i>Medical Age,</i> November 10th, 1897.</div>

THE CLINICAL JOURNAL.

CONTENTS.

MITRAL STENOSIS.

FROM THE CLINIC OF

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At St. George's Hospital, October 21st, 1897.

IN order to understand the effects of mitral stenosis it is essential that the morbid changes in the heart should be clearly understood.

Morbid anatomy.—There are two forms of mitral valve stenosis; that in which the orifice is in shape crescentic or button-hole, and that in which it is round and funnel-shaped. But very often a transition between the two is found, and then, when looked at from above, the orifice is somewhat button-hole in shape, while from the ventricular aspect the depression of the valve segments gives it a funnel-shaped appearance.

Button-hole mitral.—The adjective "button-hole" refers, it must be remembered, to the shape and not to the size of the orifice. It is to be regretted that sometimes it is used as if it was synonymous with a much-contracted valve, and is employed much in the same way as the expression pin-point pupils is with regard to the condition of the pupils in extreme myosis. This is inaccurate, for every contracted mitral is not button-hole, and

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indeed many of the most narrowed orifices are not button-hole mitrals.

Normally in systole the edges of the mitral valve segments meet along a curved line, so that the closed orifice is button-hole in shape; when the valve segments become thickened and rigid, and retain this their normal position in systole, a button-hole slit is left.

FIG. 1.
Diagram of normal condition of mitral valve from above.
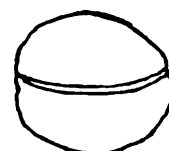
FIG. 2.
Diagram showing commencing adhesion of segments in mitral stenosis.

FIG. 3.
Diagram showing formation of funnel-shaped mitral.

Generally speaking, chronic valvulitis would, by cicatrisation and contraction of the valve segments, lead to their becoming puckered and retracted, so that simple mitral reflux and incompetency would result. If, however, the extremities of the adjacent valve segments become united by vegetations, and so welded together (*vide* Fig. 2), retraction seems to take place towards the centre of the orifice, or to be concentric, rather than from the centre of the valvular orifice, or to be eccentric, and so mitral constriction instead of mitral incompetence results.

What determines this welding together of the valve segments? It would appear probable that any endocarditis occurring in a heart where the valve segments are already thickened and rigid would supply vegetations which by growing together, union by the third intention, would provide the necessary factor in the evolution of mitral stenosis.

This is the explanation which appeals most to my own mind. In cases of mitral stenosis it is fairly common to find fresh vegetations along the edge of the thickened mitral valve. These may be due to two causes; (a) a fresh attack of rheumatism, or (b) endocarditis due to strain. In many cases of mitral stenosis, however, the clinical evidence of recurrent attacks of rheumatism is not forthcoming, and we are then left with the supposition that the welding together of the valve segments is due to endocarditis set up by strain.

The chronic inflammatory process spreads from the valve segments to the chordæ tendineæ, which become thickened and welded together, thus imitating the behaviour of the valve segments. The brush of delicate chordæ tendineæ becomes amalgamated into two or three thick strands, which, like all cicatricial tissue, tend to contract, and the valve is pulled down into the cavity of the ventricle so that the valve appears funnel-shaped from below, though the rigid valves surround a slit-like or button-hole mitral.

Funnel-shaped mitral.—By continuation of the process of blending and welding together of the rigid edges of the valve segments the slit or button-hole orifice may gradually become converted into a round orifice. In this way the funnel-shaped mitral can be derived from the button-hole form (*vide* Fig. 3).

The thickening and contraction of the chordæ tendineæ depress the united segments into the ventricle, and thus completes the funnel-shaped mitral.

Although the funnel-shaped mitral may be derived from the button-hole form, it must not be supposed that this sequence is in any way inevitable and unvarying. Cases of long standing mitral stenosis may simply present the button-hole form.

On theoretical grounds it might be supposed that a button-hole and a funnel-shaped mitral would present different physical signs; that a button-hole mitral could give rise to pure obstruction, while a funnel-shaped mitral would give rise both to obstruction and, since it is held rigidly open, to regurgitation as well.

The effects of mitral stenosis.—There is a constant obstruction to the onward flow of blood through the mitral orifice ; this contrasts with mitral reflex, where the blood is intermittently driven back by the hypertrophied left ventricle on to the lungs, but in the intervals can return without any impediment into the left ventricle.

Mitral stenosis and regurgitation are often combined, but in order to simplify matters we will only consider the effects of pure stenosis. As less blood enters the ventricle, it tends to become smaller than in health, and its development is also interfered with by a blood-supply which is impaired since the blood pressure on the coronary arteries is diminished. The apex-beat is a little nearer the sternum than in health, and is somewhat feeble. Since the left ventricle is less well filled than in health, and so loses its normal stimulus to contract, it tends to do so less frequently. In the earlier stages of mitral stenosis, therefore, the pulse may be, though it is not necessarily slower than natural. In passing we may note that the only two diseases of the heart in which it beats more slowly than natural are mitral stenosis in the early stages, and aortic stenosis. In the later stages of mitral stenosis the pulse is rapid and very irregular,—in fact, the two chief pathological conditions in which the pulse is irregular are dilatation of the left ventricle and advanced mitral stenosis. In mitral stenosis the irregularity depends on the left auricle becoming over-dilated, and, from over-distension and over-stimulation of its walls, irritable, so that it starts irregular—sometimes, indeed, abortive—contractions which spread to the ventricle.

The first effect of the constant obstruction at the mitral orifice is dilatation of the left auricle ; this shows itself clinically by upward extension of the cardiac dulness to the third or second rib. In this area there may be pulsation due either to the pulmonary artery and infundibulum of the right ventricle from which the pulmonary artery arises, or, as some think, to the forcible contraction of the auricle itself. It should be remembered that in other cases pulsation in this situation may be communicated from an unduly exposed pulmonary artery, the left lung being retracted as the result of past inflammation, usually tuberculous.

The distended auricle should, in accordance with the rule that whenever there is obstruction to the passage of blood out of any orifice of the heart the first change which occurs is hypertrophy, undergo compensatory hypertrophy of its muscular walls ; and so to a certain extent it does, but there

is so little muscular tissue available in its walls that the hypertrophy is, so to speak, taken on by the cavity next behind, viz. the right ventricle. The hypertrophy of the right ventricle constitutes the compensation in mitral stenosis, and clinically is evidenced by pulsation in the epigastrium.

The increased blood-pressure in the left auricle leads to thickening of its lining endocardium ; this may be regarded either as a physiological hypertrophy, or as a pathological chronic endocarditis due to strain. It should be remembered that normally the endocardium of the left auricle is thicker than that of the right, but in mitral stenosis this is exaggerated.

The blood stagnates to a certain extent in the dilated auricle, more especially in the auricular appendix ; and partly as a result of the stagnation, partly as a result of imperfect nutrition of the lining endocardium, clotting of blood may take place during life. The appendix of the auricle is the usual site ; in exceptional cases only does a clot of any size arise elsewhere in the auricle. You have lately seen a large pedunculated clot arising from the septum of the auricles in a case of Dr. Ewart's.[*]

These ante-mortem clots are firmly fixed to the wall of the auricular appendix, and undergo a certain amount of organisation ; the central portions are very prone to soften down, so that a cavity is formed. These thrombi have been described as "suppurating cardiac polypi." The clot may, as already implied, become pedunculated, and a round mass arises from a stalk which is attached to an endocardium of the auricular appendix. This pedunculation probably depends on the muscular contraction of the appendix moulding the soft blood-clot, and extruding it into the more roomy auricle.

The pedunculated part may get broken across, and a loose ball of fibrinous blood-clot, perhaps softened internally, or, as one of our museum specimens shows, solid throughout, remains in the cavity of the auricle. The ball clot thus formed is an exception to the rule that ante-mortem blood-clots are firmly adherent to the wall of the vessel or heart, but only an apparent exception, for, as has been shown, it was at one time firmly adherent. These ball clots may remain in the auricle without producing any untoward symptoms, since they are too large to pass through the constricted mitral

orifice. In a few cases they appear to have been driven into the stenosed mitral orifice, and by their impaction there to have produced sudden death.

When smaller patches of clot become detached and pass into the ventricle, they give rise to embolism in the systemic vessels ; when they lodge in the middle cerebral, to hemiplegia ; and it is important to bear in mind embolism as a cause of hemiplegia in young girls. If the embolus lodges in the vessels at the base of the brain, which lying on the subarachnoid space are badly supported, the artery may be so damaged by the impact that an aneurysm results at the site of the embolus, just as in rare instances an aneurysm occurs at the site of a ligature. Another situation where a simple non-infective embolus may give rise to an aneurysm is the poorly supported arteries of the mesentery. In both cases the unsupported condition of the vessels is the disposing cause of the giving way of the arterial walls.

Such aneurysms may rupture and give rise to extensive hæmorrhage. I was much impressed by a case illustrating this. A girl was brought in to St. Bartholomew's Hospital some years ago when I was house physician for Dr. Church, insensible and affected with hemiplegia. On examining her heart it was found that she had signs of mitral stenosis. She rapidly died, and feeling confident of the diagnosis I rashly signed the death certificate "mitral stenosis, cerebral embolism," before seeing the post-mortem examination, which showed extensive cerebral hæmorrhage from rupture of an aneurysm, which no doubt was in its turn the result of past embolism.

Embolism of the arteria centralis retinæ occasionally occurs, giving rise to loss of vision.

Embolism of the end arteries in the kidney and spleen produces an infarct, and the absorption of tissue fibrinogens derived from the necrosing cells of the infarcted area gives rise to an elevation of temperature. At the time of the embolism there may be violent pain in the splenic region, with some peritonitis, as shown by tenderness and pain on taking a deep breath, suggesting pleurisy : the spleen, too, may be found to be slightly enlarged. In the case of the kidney the signs are slight or not noticed, probably because its relations to the peritoneum are limited as compared with those of the spleen. Hæmaturia is very seldom seen.

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[*] *Vide* ' Trans. Clin. Soc.,' vol. xxx, p. 190.

Infarcts do not, except under most exceptional conditions, occur in the liver, as there is a double blood-supply to the liver, from the hepatic artery and portal vein.

When a large branch of the superior mesenteric artery is blocked, a loop of intestine may become gangrenous, and the signs of acute intestinal obstruction result ; but from the free anastomosis such an accident is very rare. Still, its possibility should be borne in mind when a patient with mitral disease suddenly develops acute obstruction.

Embolism of the arteries of the limbs gives rise to sudden acute pain, followed by loss of power ; but since it usually occurs in young subjects with healthy arteries, the free collateral circulation prevents gangrene, which in old persons would be likely to result.

The constant damming up of the blood in the left auricle leads to a similar condition in the lungs, which undergo the change known as brown induration. They are darker in colour than· natural ; constant dilatation of their capillaries gives rise to extravasation of red blood-corpuscles into the substance of the walls of the air-cells, and degenerative changes in the hæmoglobin lead to pigmentation. The lungs are moister than natural, and prone to catarrh. Bronchitis is thus a common incident in the course of such cases. The moist condition of the lungs probably accounts for the rarity of pulmonary tuberculosis in mitral disease. They are both common diseases, and would naturally coincide occasionally, but this is extremely rare. The moist condition of the lungs probably leads to the removal of any tubercle bacilli which may be inspired, before they have had time to take root and multiply.

The stagnation in the pulmonary veins necessitates a similar condition in the pulmonary artery ; the increased strain due to the obstruction in front and the hard-working, hypertrophied right ventricle behind shows itself clinically by the accentuated and sometimes reduplicated second sound over the pulmonary artery. The forcible closure of the pulmonary valves can often be felt in the second left interspace as a shock. Pathologically the effect of this continued high blood-pressure or strain from within is to give rise to chronic endarteritis of the branches of the pulmonary artery. The atheroma in its turn leads to a dilated condition

of the pulmonary arteries, endarteritis deformans, and rupture may occur. The blood is then poured out into the lung tissue—a pulmonary apoplexy. As a result hæmoptysis occurs, while the pleura may become inflamed and an effusion may follow. Rupture of vessels brought about as described is the most frequent cause of pulmonary apoplexy. It may be due to an embolus from the right side of the heart, but it is usually difficult to make out that the clotted blood in the artery going to the apoplexy contains any embolus ; the thrombosis is usually, as shown by its age, secondary to the apoplexy. That embolism from the right side of the heart may give rise to a so-called pulmonary infarct is undoubted, but it is equally true that an embolus may occur in the pulmonary vessels without any "apoplexy" or infarction resulting in the lungs. It is generally thought that pulmonary apoplexy is commoner in mitral stenosis than in mitral regurgitation ; but in 70 cases of pulmonary apoplexy tabulated by Dr. Lee Dickinson from the post-mortem records of this hospital, only 16 were associated with mitral stenosis, most of the rest being cases of mitral reflux. It is possible that the sudden pumping back of blood in mitral incompetence brings a sudden strain to bear on the delicate terminals of the pulmonary vessels, which is more detrimental to them than the sustained high pressure of mitral obstruction. In passing we may notice that pulmonary apoplexies occasionally depend on the dilatation of the left ventricle and the resulting mitral incompetence which occur in the course of nephritis, whether chronic or acute.

The hypertrophy of the right ventricle shows itself not so much by increase in the thickness of its muscular wall, as by an alteration in their firmness ; it becomes tougher, more resistent, and denser. This hypertrophy constitutes the compensatory mechanism against obstruction to the pasage of blood through the mitral orifice ; the danger that may result from this compensation has already been referred to—pulmonary apoplexy. As a result of the gradually increasing obstruction at the mitral valve in front, and the hard-working, hypertrophied left ventricle behind, the thin-walled vessels in between may give way. The increased pressure inside the hypertrophied right ventricle may produce thickening of the lining endocardium, and especially of that part which by its reflection

forms the tricuspid valve, so that a certain amount of chronic valvulitis is produced. The thickening of the valve segments is, however, not a very serious thing, and probably of itself does not often give rise to tricuspid regurgitation ; the chronic strain may perhaps in some instances lead to the valve segments becoming united together, and so to tricuspid stenosis ; but this is rare. Tricuspid stenosis is practically always associated with mitral stenosis, and is produced either as described above, when it is directly secondary to mitral stenosis, or is partly due to this and partly due to acute endocarditis of rheumatic origin.

When the mitral obstruction, which from cicatricial contraction tends to be progressive, reaches a stage at which the hypertrophied right ventricle can no longer drive the blood satisfactorily through into the left ventricle, the compensation fails and the right ventricle dilates. The same result is brought about if the resistance in the lungs is greatly increased by intercurrent bronchitis, or if the nutrition of the right ventricle is otherwise impaired. When the right ventricle dilates, the ring, partly muscular, partly fibrous, at the base of the ventricle from which the valve segments arise, dilates with the rest of the ventricle, and the valve segments are unable to meet. Tricuspid regurgitation results, and the compensation is said to be ruptured. There are thus three stages as regards the state of the compensation ; the first where it is good or perfect, the second where it is strained and likely to fail, and the third where it has given way entirely. It is in the second and third stages that patients come with symptoms of heart disease.

Let us first trace the effects of tricuspid regurgitation. The blood will no longer be driven forcibly on into the lungs, and the left auricle will no longer be so well distended with blood; but the blood will be partly driven back into the right auricle and venous system generally, and partly onwards into the pulmonary artery, though at a much lower tension than before. The proof of the lower tension in the pulmonary artery is the disappearance of the accentuation of the pulmonary second sound, which becomes, if anything, less marked than in health. The backward pressure has become transferred, from the lungs and right side of the heart, to the venous system, which becomes engorged with blood, while the arterial system becomes comparatively empty. The

diminished pressure in the left auricle accounts for the disappearance of the presystolic murmur, and all that may be heard over the apex is a systolic murmur due to concomitant regurgitation, perhaps no definite murmur at all.

As a result of tricuspid regurgitation, a systolic murmur may be heard at the bottom of the sternum ; but, as a matter of fact, it often is not. The dilated right auricle and right ventricle give rise to increased dulness to the right of the sternum and epigastric pulsation.

We will now briefly trace the effects of general venous engorgement due to tricuspid regurgitation. Each time that the right side of the heart contracts, the blood is driven backwards into the venæ cavæ. The backward pulse does not for a time appear in the jugular veins. This is due to their orifices into the innominate veins being guarded by valves, which only become incompetent when the dilatation of these veins has so enlarged the circumference of the orifice of the jugular veins that the valves situated there are unable to come in contact. The pulsation in the neck which then results has a somewhat vermicular character and is double, there being two waves for each beat of the heart—one for the auricle, one for the ventricle, of which the latter is the best marked. This pulsation can be exaggerated by pressure on the liver, which probably acts by driving a larger quantity of blood up into the head and neck. The engorgement of the veins in the head and neck accounts for the characteristic complexion of patients with advanced mitral disease, and for any disturbance of cerebral function.

The blood being driven into the inferior vena cava produces chronic engorgement of the hepatic and sublobular veins ; the liver becomes enlarged, and, from the tension exerted on its capsule, tender. As a result of venous stagnation, the functions of the liver are imperfectly performed. The liver cells tend to atrophy, and undergo fatty degeneration, and there is some stagnation of bile. On section the liver presents an appearance which has been compared to the section of a nutmeg, the sublobular and the intra-lobular veins in the centre of the lobule standing up as prominent purple areas, which contrast with the surrounding liver substance, which is pale from fatty degeneration, and perhaps bile-stained. Sometimes, but much more rarely than one would

expect, the hepatic veins are so dilated that the liver expands with each beat of the heart like an accordion. This pulsation must, of course, be distinguished from transmitted pulsation either from the heart or more rarely from an abdominal aneurysm. As the result of the partial atrophy of the liver cells, which is specially marked in the centre of the lobules, and is due partly to a deficient supply of arterial blood and partly to the constant pressure exerted by the dilated capillaries, a certain amount of fibrous substitution occurs. This may be called cardiac cirrhosis, but is not comparable either in its degree or in its effects to common cirrhosis starting from the portal vein. The venous stasis in the liver produces a similar condition throughout the portal vein, giving rise to dyspepsia, from which cardiac patients especially suffer, to imperfect absorption of food, and to irregularity of the bowels, generally constipation. The interference with the assimilation of food may induce an ill-nourished habit of body; this is especially the case in growing children, among whom morbus cordis is a " wasting disease."

As a further result of continued portal stagnation ascitis results, and this is associated with chronic thickening of the peritoneum; the abdominal distension compresses the lungs and further embarrasses respiration.

All the abdominal organs share in the venous engorgement; the spleen becomes firm and hard, but is not appreciably increased in size unless there is fever. The pancreas becomes enlarged, firmer than natural, and shows a varying amount of fibrous increase, in very rare instances clinically simulating an abdominal tumour.

The kidneys of chronic venous congestion are tougher than natural, and at the post-mortem not engorged as they must be during life, but, contradictory as it seems, slightly paler than in health. Being rather badly supplied with arterial blood, the delicate epithelium covering the glomerular tufts is likely to degenerate and allow albumen to pass into the urine; a similar result often occurs in fevers and toxæmic states, and accounts for febrile albuminuria. As a result of the comparatively low arterial pressure in the kidneys, the urine is diminished in amount and high coloured. As in the liver so in the kidney, chronic venous congestion necessitates an impeded and impaired arterial blood supply; on this follows a certain

amount of atrophy of the active, secreting parts of the kidney, and the fibrous supporting tissue of the organ becomes more evident, and perhaps actually, as well as relatively, increased in amount. A real granular kidney is never produced, but a fair naked-eye imitation of it may result from the scars left by numerous infarcts, but you must be on the alert to distinguish these two conditions.

The backward pressure in the inferior vena cava leads to œdema of the legs, so that in the last stages of tricuspid regurgitation the patient is generally waterlogged all over the body and limbs. There is an important difference between mitral stenosis and mitral regurgitation as regards the development of œdema; it appears early in the course of regurgitation, late in stenosis.

In conclusion, we will consider briefly a few points of interest in connection with the murmurs of mitral stenosis. Time will not allow of a full discussion of the many interesting questions involved, so we will not at present go through the signs characterising the three stages of mitral stenosis.

The apex beat, as we have seen, is rather nearer the sternum than in health, and at this point the presystolic murmur is heard, usually over a limited area; but sometimes this area spreads out very considerably. At the apex a presystolic thrill, due to the coarse eddies induced in the blood stream as it is driven from the auricle through the constricted mitral orifice into the ventricle, may usually be felt when there is a presystolic murmur; the thrill and the murmur being the palpable and audible manifestations of the eddy in the blood stream. The thrill is, of course, intra-ventricular. This is of some importance in distinguishing a genuine thrill from a vibration of the chest wall which simulates it—a pseudo-thrill. When the whole hand is placed on the chest wall, vibrations conducted from a forcibly-beating heart to several intercostal spaces may produce a thrill which is really only due to the pulsation of the chest wall being interrupted by the rigid ribs. In such a case, if the fingers be separated and placed over the intercostal spaces, the sensation of the thrill disappears, and a pseudo-thrill due to vibration of the chest wall can thus be distinguished from the finer, purring thrill produced inside the left ventricle in mitral stenosis. The presystolic murmur is extremely capricious, comes and goes

within short intervals of time, and may be replaced by the mid-diastolic or early diastolic murmur.

The mid-diastolic murmur is the commoner, and is best heard at the apex, immediately after the second sound, so that it is often described as re-duplication of the second sound. It can be distinguished from true reduplication of the second sound by listening at the base of the heart, where the second sounds are produced ; if there is no reduplication there, what appears to be reduplica-tion at the apex must be something else. This mid-diastolic murmur is probably due to the suction-pump action exerted by the left ventricle producing an eddy in the blood stream as it rushes in from the auricle. The early diastolic murmur which replaces the second sound, and is of the same character as the aortic diastolic murmur, is best heard about the fourth left costal cartilage, but is often well heard at the apex. This is Hope's murmur described by the first assistant physician to this hospital. Comparatively rare though the murmur be, its causation has given rise to a good deal of discussion. It has variously been ascribed (a) to the same cause as the presystolic murmur, namely, the forcible contraction of the left auricle, which in this case is supposed to begin abnormally early in the diastole, producing an eddy in the blood as it runs through the constricted mitral ; (b) to the same cause as that giving rise to the mid-diastolic murmur, namely, the suction-pump action of the left ventricle ; and (c) more recently to regurgitation through the pulmonary valves,—a kind of safety-valve action brought about by dila-tation of the trunk of the pulmonary artery which results from backward pressure.

Though, generally speaking, the presystolic murmur means mitral stenosis, there are exceptions to this, as to most rules. The best known ex-ample of this is Flint's murmur, a presystolic murmur audible at the apex in cases of well-marked aortic regurgitation without any organic narrowing of the mitral valve ; the production of the murmur can be explained by supposing that the regurgitant column of blood strikes the anterior or aortic cusp of the mitral valve, bulges it in, and thus temporarily diminishes the size of the mitral orifice, through which at this time (diastole) the blood is pouring into the ventricle from the auricle, or by supposing that irregular vibrations are set up in the mitral valve by the impact of blood re-

gurgitating from the aorta. The presystolic mur-mur is also heard in some cases of dilatation of the ventricle, and especially in children with adherent pericardium. In some of these cases there is probably greater dilatation of the left ventricle than of the mitral orifice, so that a certain degree of relative stenosis is brought about.

A CLINICAL LECTURE

ON CASES OF

HYSTERICAL PARALYSIS:

Prefaced by a case of Gumma of the Frontal Region mistaken for Pernicious Anæmia ; and two cases showing the association of Neurasthenia with Vaso-motor Dis-turbances.

Delivered at the Hospital for Diseases of the Nervous System, Welbeck Street, London,

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Reported by Dr. PATRICK MACGREGOR, Clinical Assistant.

GENTLEMEN,—Before proceeding to the principal subject of our studies to-day I wish to direct your attention to a section under the microscope of a gumma of the brain. It comes from a case to which I referred in my last lecture on Facial Paralysis, and which I should have shown you on that occasion had time permitted.

The gummatous material, such as that you see beneath the microscope, was deposited over the whole of the superior and middle frontal convo-lutions on both sides of the falx major. The case is one I am never tired of referring to, because it shows, amongst other things, how much more we may learn from our mistakes than from our suc-cesses in our journey through life. The boy was 15 years of age when admitted into the Croydon Hospital for intense chlorosis, under the care of the late Dr. Lanchester, whose permission I had to publish the case. His anæmia increased in spite of iron and many other remedies, and the only other symptom he presented was pyrexia, of an intermitting type, being nearly normal in the

morning and 100°—102° in the evening. He was in that hospital for nine months, and then died slowly from intense anæmia and exhaustion. His case was thought to be one of pernicious anæmia, which would account for the loud systolic murmur heard all over the cardiac area, and other symptoms. He came of most respectable parents, and he himself had had a very healthy existence with the exception of deafness almost from birth in the left ear. At the autopsy nothing abnormal was discovered in the various abdominal and thoracic viscera. The arteries were stained purple, and the endocardium presented a red jelly-like deposit. We did not open the head at first, because he did not present any cerebral symptoms, and we were about to agree that the case was one of pernicious anæmia without any gross lesions. But on second thoughts we removed the calvarium, and then to our surprise found this gummatous mass stretched across the frontal region on both sides, as well as gummatous material in the left petrous bone. Then we did what we ought to have done during life—examined his bones. We found gummatous nodules on the ribs and at the back of the clavicle. We examined the corneæ, and saw striæ in both. That case has taken a firm hold on my mind, because it teaches many things. It was undoubtedly a case of hereditary syphilis, and shows that one should always be on the alert for this malady, even amidst the most respectable surroundings. It is, moreover, a matter for regret that I did not act on the golden rule to examine *every organ carefully* in a case of doubtful diagnosis. The case also is suggestive that many cases of so-called pernicious anæmia are really cases of syphilitic anæmia,* and I am always a little doubtful about the diagnosis of cases of the former condition unless confirmed by autopsy. Finally, here we have one more illustration of the fact that an extensive intracranial deposit or tumour may exist without definite symptoms during life, so long as the frontal region only is involved.

I want next to show you a very interesting case of neurasthenia, which belongs really to a former lecture on that subject,† but which the chances of

clinical work have only enabled me to bring before you to-day. The young woman, Martha L—, is now 30 years of age, and ever since her nineteenth year, over the long period of eleven years, she has suffered on and off from severe neurasthenic symptoms, viz. nervousness, tremor—attacks of which come on with very trivial causes,—headache, spinal tenderness, insomnia, very marked agoraphobia, and mental derangement. The mental trouble has at times been so severe that she has been twice in an asylum for a period of about nine months.

You will recollect I pointed out that in cases of persistent neurasthenia without obvious cause Graves' disease should always be suspected; and you will notice that this patient's eyes are somewhat prominent, and that the thyroid gland is slightly but definitely enlarged. Her pulse also is very rapid, usually about 128 per minute, and she often suffers from palpitation, attended by flushing all over, and followed sometimes by shivering. Thus she manifests the four groups of symptoms* associated with Graves' disease; but the proptosis and thyroid enlargement only came on within the last three or four years. I wish to lay particular stress on the fact that you may find the neurasthenic and cardio-vascular symptoms months or even years before pronounced physical signs, referable to the eyes and thyroid gland, become manifest. I recently saw a case in consultation with Dr. Evans in which, for three years, the only symptoms were the neurasthenic and cardio-vascular ones; then the thyroid increased in size, and the eyes became prominent. In the patient before you the eyes are prominent, though not very markedly so, and you can see for yourselves the enlarged thyroid body. Still, her most obtrusive symptoms are those included in the term neurasthenia; and you will observe that they are very closely associated with vaso-motor disturbances.

Before coming to the subject announced for to-day, there is still another case I should like you to see. It is a severe case of acroparæsthesia, and shows well the transition of that disorder into Raynaud's disease. This condition may be briefly defined as a sensory and vaso-motor

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* This question is further dealt with in a clinical lecture " On Conditions which are liable to be mistaken for Idiopathic Anæmia," 'Clinical Journal,' Feb. 13th, 1895.

† See 'Clinical Journal,' Jan. 19th, 1897.

* Viz., proptosis, thyroid swelling, cardio-vascular and nervous symptoms.

disorder, affecting the extremities symmetrically and producing various painful and other subjective sensations in the hands and sometimes in the feet. I have long suspected, and doubtless others have also, that the acroparæsthesia is but a mild type or a first stage, as it were, of Raynaud's disease, and this case goes a long way to prove the correctness of this contention. The patient, Louisa T—, is now 52 years of age, and she has passed the climacteric by some five or six years. During the last twelve months she has suffered very severely from a feeling of burning, pricking, and throbbing in both hands, attended by redness and swelling of the hands and wrists; coming on in paroxysms at first only occasionally, but latterly being continuous, though much worse at times. These attacks have occurred chiefly at night, and been attended with marked redness and some swelling of the parts (a kind of solid œdema), such as you see now. At night the pain was sometimes so intense as to prevent her sleeping or even turning in bed. Her left hand, with the exception of the forefinger and the thumb, is almost anæsthetic, but this may be due to the thickening of parts. The right hand is more normal.

It is a typical though severe case of what is called acroparæsthesia. Such cases are generally supposed to be very rare, but I have six or eight cases under my care at the present time, and am inclined to think they are less rare than is generally supposed. The disease bears a strong resemblance to Raynaud's disease, and, like that disorder, is one of the few morbid states which throw any light on lesions of the vaso-motor system. But my object in bringing this case before you to-day is to show the intimate relation there is between such vaso-motor conditions and neurasthenia. This patient presents many of the typical symptoms of neurasthenia, and you can see that the act of coming into the room before this large audience has caused an attack of violent trembling.

As regards the treatment of this case, her pain and sleeplessness have been much relieved by ammonium bromide, but the puffy red condition of the hands still remains. This appears to be due, as in Raynaud's disease, to a vaso-motor paralysis and persistent serous exudation. This I hope to reduce by large doses of calcium chloride.* Other

* Vide 'Lancet,' Aug. 1st, 1896; and 'Brit. Journ. Derm.,' Feb., 1896.

remedies which are useful in these cases are galvanism, belladonna locally, and hot water baths. You will, I trust, pardon the digression, but both of the two cases which I have brought before you illustrate very clearly the close association which in my belief exists between neurasthenia and vaso-motor disturbances. As a matter of fact, in all the many neurasthenic cases I have seen I have never failed to elicit clear evidences of vaso-motor disorder, and the conclusion is irresistible that either one is the cause of the other, or they are derived from a common cause.

To come now to the legitimate subject of to-day, *hysteria*, I want to direct your attention to this woman, E— R—, aged 42. She is married, and has two healthy children. Her own history is a most instructive one, and will serve to exemplify all, or nearly all, the principal points in the disease. The family history is as follows :—Her mother died in an asylum from alcoholism, and her father was addicted to drink. The patient has had eight brothers and sisters who died of phthisis before reaching their twentieth year. She has only one brother and one sister alive, and the sister suffers from "nervousness and fainting attacks." Our patient was "excitable" and "mischievous" as a child, very troublesome at school, and was said to be "delicate." At the age of 14 she went into service, and curiously enough she seems to have been free from symptoms in her early years, for she remained eleven years in one situation.

Her nerve symptoms began at the age of 28 (1882), when she entered the Lambeth Infirmary for "paralysis," and remained there two years. During that period she had attacks of unconsciousness once or twice a week. In one of these attacks the unconsciousness is said to have lasted a month, and she tells us that she was "laid out as dead." In all probability these attacks of unconsciousness were cataleptic seizures. At the end of these two years she was sent to Leavesden Asylum, but only remained there for six weeks. She then kept fairly well for two years, but at the age of 32 she went into Paddington Workhouse, where she had a series of convulsive attacks, which became more and more frequent, until, we are told, there was only ten minutes interval between them.

During these attacks she lost consciousness, and on one occasion bit her tongue and fingers, and had to be tied in bed. These fits were followed by "loss of power" in the limbs, chiefly on the left side, and "loss of feeling" on the left side.

She recovered, however, and when she was 33 years of age (1887) she had a severe fright, and was bitten by a dog, the first probably being the more important cause of her subsequent troubles. This occurrence was followed by numerous and frequent fainting attacks. In October, 1887, during one of her fainting attacks, she fell from the top of the stairs to the bottom, and was "unconscious an hour." On regaining consciousness all the left side was "stiff and paralysed," and she was conveyed to St. Thomas's Hospital in a cab. Dr. MacGregor has kindly sought out the notes of the case at that hospital, from which we learn that there was rigidity of the left arm and hand at that time, there being only a little free voluntary movement of the shoulder. The left leg was rigid at the hip and knee, though the ankle was not quite stiff. There was anæsthesia and analgesia of the left half of the body, excepting only the sole of the left foot, the conjunctiva, and part of the abdomen. The left side of the tongue and mouth were anæsthetic, and both sides of the palate and pharynx also. Smell was lost on the left side; hearing was normal. Vision, however, was almost completely gone on the left side, and was only present in the temporal half in the right field of vision; I show you a copy of the perimeter chart by the courtesy of the Medical Registrar of St. Thomas's Hospital. After the patient had been in St. Thomas's two or three days the anæsthesia began to shift, but she never quite lost it.

The next year (1888) she was admitted into St. Mary's Hospital, with much the same condition of affairs. We have reason to believe that the contracture and anæsthesia on the left side which she has now, and which commenced at the time of the fall downstairs, have persisted with very little modification ever since. You will observe, gentlemen, how persistent hysterical symptoms may *sometimes* be; though they have varied in the interval, sometimes from day to day.

When she first came under my care in March, 1896, she had contracture and anæsthesia of the whole of the left side of the body, and all the other symptoms very much as they were in 1887 and 1888. She has considerably improved since then, and I believe that the change is largely due to hypnotism.

On April 14th she was hypnotised for the first time, and the rigidity at once became considerably reduced. The procedure adopted was to throw the patient, by fixing her gaze, into a state of lethargy. Then by stroking the limbs they became flaccid, and after she awoke they remained flaccid for about an hour. On three successive occasions the same procedure was adopted, and in addition, the plan of post-hypnotic suggestion was adopted, the patient being assured that her limbs would completely lose the rigidity and regain their power. The result on each occasion was to gradually increase the period of recovery, and there was at last only a vestige of her former trouble remaining.

I did not see her again for some months, until a few days ago. We then found that the anæsthesia and stiffness had shifted; the sensation is now entirely absent from the *right* side, and there is some slight stiffness in the corresponding limbs, while those of the left side are quite normal.

The diagnosis of this case is pretty clear. Hysterical cases are generally recognised by four features. *First*, there is an absence of the other signs of organic disease; for example, though this patient's sight is seriously affected, there is nothing in the nature of optic neuritis. *Secondly*, in hysteria the symptoms are nearly always inconsistent with a *single organic* lesion. To account for the complete right hemianæsthesia in this patient she must have a complete interference with the sensory tract in the encephalon; and, as you know, the sensory tract passes through the posterior third of the posterior limb of the internal capsule, close to the leg fibres. Therefore somewhere between the cortex and the spinal cord there should be a lesion involving all these sensory strands, and this would produce a permanent hemiplegia differing considerably from what we have here. Again, to account for all the symptoms in this case, there must be some lesion of the first cranial nerve, the second cranial nerve, and of the fifth. In other words, there must be a large number of scattered organic lesions to account for all the symptoms.

The *third* means of diagnosing hysteria is by certain special features which attach to the various hysterical symptoms themselves, which cause them

to differ from the same symptoms when arising from organic causes. If it be anæsthesia, or contracture, or paralysis, each has its peculiar character; and one of the most frequent characteristics in any of these is a suddenness of advent, dating, perhaps, as in R—'s case, from a fright or emotional shock. There is, however, nothing more characteristic than the *hemianæsthesia of hysteria*, and hemianæsthesia is one of the most frequent of hysterical manifestations. I am glad, therefore, to be able to show you a case in which the sensory disturbance is so complete and so characteristic of the malady. The hemianæsthesia is generally on the left side in these cases. M. Briquet,* who was, perhaps, the greatest observer of hysteria who ever lived, until the days of Charcot, states in his work on the subject, which is unfortunately out of print, that in 85 per cent. of the cases the hemianæsthesia is left-sided. Another characteristic of hysterical anæsthesia is that it involves the special senses as well as cutaneous sensation, as it does in our case; and further, that it affects the mucous membranes. Pharyngeal anæsthesia is often present, as it was in our patient. Though I have never heard it suggested, it seems to me very probable that hysterical retention of urine is caused by anæsthesia of the bladder. Again, the anæsthesia in hysterical subjects is apt from time to time to shift its position spontaneously from side to side. Sometimes it may be made to shift by artificial means, though we are not often fortunate enough to have cases like those in France in which, by placing magnets near the patient, the anæsthesia is shifted.

The characters special to *hysterical paralysis* are somewhat variable; but there are a few rules which are worth bearing in mind. (1) It is more often of sudden advent than not, or at any rate it comes on in a few days, never slowly over a course of weeks. I bear in mind the case of a young lady who suddenly fell down in front of me while going out of church one day, and who subsequently came under my care, when I found she had been suddenly attacked in this way by hysterical paralysis of both legs. Hysterical paralysis dates, like most of the other symptoms of hysteria, very generally from some emotional shock or overstrain of the nervous system; and there is nothing more

* 'Traité clinique et thérapeutique de l'Hystérie. P. Briquet, Paris, 1859.

calculated to produce emotional disturbance than religious exercises. (2) As regards the part most frequently involved, hysterical hemiplegia is the most common, and here again the left side is three times more commonly affected than the right. Next in order of frequency comes hysterical paraplegia, in which case one leg is often more involved than the other. One or both of the upper limbs are sometimes affected; the face very rarely. (3) The degree of paralysis is very variable, but it is more often incomplete, and should be called rather paresis than paralysis. (4) It is apt to *vary in its severity* from week to week, sometimes from day to day. This is quite consistent with its long duration, several examples of which are before us to-day. (5) It may be flaccid or rigid; but in my experience is more often attended by rigidity, as it was in the case of the young lady I have just mentioned. The deep reflexes are very generally exaggerated. (6) The paresis is generally accompanied by some subjective sensation—anæsthesia, hyperæsthesia, "pins and needles," or actual pain.

The *fourth* means of diagnosing hysteria is by the presence of certain hysterical "stigmata," as they are called,—that is to say, characteristic signs which indicate the diathesis with which a person is born, and which generally becomes evident some time during life. The hysterical stigmata, or evidences of the hysterial diathesis, on which I place most reliance are four, or possibly five, in number. First comes anæsthesia in some part of the body—usually a hemianæsthesia having the characters already described. Sometimes, if there is nothing to direct the patient's attention to it, she is unaware of this loss of sensation, and therefore careful search should be made all over the integument. Secondly, there is generally a history of "globus hystericus,"—a feeling as of a ball rising in the throat, making the patient think she is choking. In the third place there is ovarian tenderness, or, as it is preferably called, the "ovarie." A slight degree of tenderness in the inguinal region is present in the patient R—. The effect produced by pressure in this region varies considerably; sometimes it starts the feeling of "globus"; or it may start a painful or suffocating sensation which rises up from the lower abdomen to the heart or chest or throat; and if the pressure be persisted in it may determine a fainting or convulsive attack. This phenomenon may be present in the

male as well as the female, as in several cases which I have recorded.* Fourthly, there is very often a history of some kind of attacks, *i.e.* nervous attacks. They may be of various kinds; they may take the form simply of "globus" in the throat, followed by a flood of tears or laughter, or other emotional outburst; or there may be syncopal, or convulsive, or cataleptic seizures, or attacks of ecstasy; or they may be those curious attacks (which are rarely seen in England) of continual hammering or tremor. Sometimes these nerve-storms come on without any obvious cause, but more often they are determined by some emotional shock; and in many patients there is a hysterogenic zone, pressure upon which will determine an attack. In the case of the patient before you we have a long history of convulsive and syncopal seizures, which have come on generally at the catamenial periods.

There is a *fifth* manifestation of the hysterical diathesis—or perhaps I ought to say, a symptom very apt to appear in hysterical subjects,—which is not usually mentioned, but which may very frequently be observed. It consists of a tendency to attacks of "flushing," followed, perhaps, by "shivering." In these the patient actually becomes crimson from flushing of the skin, and this is shortly followed by sweating, pallor, and a feeling of chilliness. In order to elicit this symptom it does not do to ask the patient a leading question; but very often patients come voluntarily complaining that they are very liable to such attacks, or else a little judicious questioning will almost invariably bring out the symptom. There are few of the manifestations that I have been describing which this patient R— has not had at one time or another.

The *ætiology* in this case is also interesting, for you will remember what an unfortunate history she had; her neurosis is obviously inherited. You will observe also that the most severe attack, which lasted nearly nine years, was determined by an injury. In that fall she probably struck her head, but there is no very precise history on that point. Probably the right side of her head was struck in her fall, because this would determine the position of the contracture and hemianæsthesia on the left side. Some emotional shock can very often

be elicited as the determining cause of hysterical manifestations, and you will remember that the first series of symptoms in the case before you were produced by a fright from a dog, and the fright caused by falling downstairs undoubtedly played an important part in producing the second series. But it is a fact not always sufficiently recognised that an injury may determine hysterical manifestations, and that it may also determine the seat of those symptoms; just as a fractured limb may determine both the outbreak and the seat of an attack of gout.

A word in conclusion about this patient's field of vision. With the left eye she is still unable to see, and here is the diagram of the field of vision of her right eye which Mr. Work Dodd has very kindly, and with infinite pains, made for us. You will observe that there is very considerable concentric retraction, and here on this chart you will see that the field for blue is smaller than the field for red—the converse of normal —a feature which Charcot was the first to reveal in hysterical cases. I show you similar diagrams from another case which I published some years ago.* The patient was a girl who had hemianæsthesia and hemiparesis.

The *prognosis* of the case before us is bad for recovery, because of the age of the patient, the long duration of the symptoms in spite of treatment, and the squalid conditions of her home. We relieved her to some extent, but the symptoms are now returning on the other side of the body. It is quite a mistake to think that hysteria is confined to the middle and upper classes of society. The marvellous field for the study of this disease at the Paddington Infirmary shows how frequently it arises among the poor and destitute, who have every motive for keeping well.

Let us turn for a moment to the subject of *treatment*. The three best ways of treating hysterical manifestations, in their order of importance, are (1) isolation, (2) massage, and (3) overfeeding. Of these, isolation, the removal of the patient from sympathetic friends and relatives, is certainly the most important measure. This must be done thoroughly, and no communication even by letter must be allowed. No half-measures are any good. If this be thoroughly accomplished,

* 'Clin. Soc. Trans.,' vol. xxii, and the 'Lancet,' 1889, vol. i, p. 934, and 1889, vol. ii, p. 792.

* "Two Cases of Neuropathic Spinal Disease," 'St, Thomas's Hospital Reports,' vol. xviii.

and the patient be completely removed *from the circumstances* under which the morbid condition arose, half the battle is fought ; and if coupled with careful additions to the dietary, kind treatment, and promoting the general nutrition by massage, the most intractable cases will yield. By these means the girl whose visual chart I showed you just now was entirely cured by one month's treatment ! The patient R— has, I think, derived most benefit from hypnotism. It is only right to add that she has been treated by ammoniated tincture of valerian from time to time, and ammonium bromide, but no advance was made until hypnotism was started, and the recovery for gradually increasing periods of time after each sitting was very marked. Bromide is useful for the restless, sleepless, irritable cases ; valerian is a useful remedy as a kind of stimulant for cases where weakness or prostration, or attacks of palpitation, syncope, and the like, are prominent features.

There is a young woman just coming in, Jane W—, the subject of *hysterical paraplegia*, who I am certain will never get cured as long as she remains at home among her sympathetic relations. You see she comes in with crutches, which she appears to need, for when left to herself her progression is extremely difficult. She is twenty-seven years of age, and two years ago she had an attack of shivering, brought on apparently by a chill. Three days after that she had pain and stiffness in the legs, and *suddenly* lost the power in both of them. A month later the right leg got well equally suddenly, but the left leg has remained stiff and almost powerless ever since. She has hyperæsthesia of this leg also, and small patches of anæsthesia elsewhere, but not very marked. The patellar reflex is considerably increased in the affected limb. In my experience it is more often increased than not in cases of hysterical paralysis, as I shall have occasion to mention again shortly. This patient has had ammoniated tincture of valerian, bromide of ammonia, and the faradic brush has been applied about once a week to the left leg, and she is somewhat better ; but I am bound to confess that there is very little change since she first came under my care about twelve months ago. The left leg is half an inch less in circumference than its fellow, and this may be accounted for by disuse. Some would regard this as part

of the disease, but we do not know when this wasting came on, and it cannot therefore be regarded as hysterical atrophy. Here again, this case shows that hysterical phenomena are not always of an evanescent character.

Before concluding I should like to say a few words about *hysteria in the male*, which is comparatively rare, though by no means unknown. In the course of my experience at the Paddington Infirmary I only met with between twenty and thirty cases. Here are photographs of some of them. The one I indicate, Thomas G—, was

aged 29, and his arm remained rigidly bent at all the joints, as you see it portrayed, for two and a half years, and he had had hystero-epileptic fits for five years. He also had segmental anæsthesia of that limb up to the limit of the shoulder. I ought to have mentioned to you that when hysterical anæsthesia is not confined to one side of the body, it is sometimes segmental in its distribution,—that is to say, it ends at the level of a line drawn horizontally around the limb, situated very often at the level of a joint, as may be seen from this picture.

This is a feature of great interest and importance, and has puzzled physiologists considerably, because it shows that, after all, the sensory and

motor functions of a limb are very intimately connected, either by means of the segmental areas in the cord, or, more probably, the so-called motor areas in the brain. In the movements of any one limb, say the arm, a large number of different nerves are involved, but these impulses all come from one cortical area which controls the muscles of the upper arm. Now in this case there was paralysis of these muscles, and anæsthesia of the skin over them. It seems to me obvious that the lesion producing this segmental anæsthesia, whatever it be—whether it be dynamic, as we call those changes we cannot see under the microscope, or gross,—must be situated in the cerebral cortex.

These cases of hystero-epilepsy are very rare in England. At the time when this one was published some years ago in the ' Clinical Society's Transactions '* I could not find any recorded case of hystero-epilepsy in English literature. The fits he had were extremely violent, and were characterised by four stages—tonic rigidity, clonic rigidity, purposive movements, and delirium. Owing to the patient's violence he was placed in an asylum, and there it was thought he had a focal lesion; accordingly they opened the head opposite the arm centre, but absolutely no abnormality was found, and the brain was not touched. The man, however, was entirely relieved from his fits.

One of the cases illustrated by these photographs was also very interesting, on account of the length of time and ultimate cure by the means I have mentioned. He was a greengrocer, J. H—, aged 55, and was admitted into the infirmary on June 7th, 1889, for paraplegia of twenty-four years' duration. He appeared at first sight very ill, and wore a most distressed, unhappy look, an aspect which he never lost, and which was in keeping with the gloomy view he took of life. He told us in a whining tone of voice, and with much detail, that his illness dated from an injury he had received to his right ankle twenty-four years previously ; that his right leg had been paralysed ever since, and that his left leg had become paralysed since then. All his life he had suffered from headaches, had been very " nervous " and " easily put out." He had been lately subject to attacks of " hot flushings," followed by " cold shivers " and trembling. In other respects his

previous and family histories were negative. On further examination we found that he had a flaccid paresis of both lower extremities ; there was no paralysis elsewhere, but there was marked wasting of all the muscles of the lower limbs, especially of the right leg. On lightly tapping the tendon of his knee a violent and wide-spread reflex movement was produced, and by increasing the force of the blow he could be jerked right out of his chair. Repeated slight blows were followed by transient stiffness of the whole limb. This is a condition which was described by Charcot under the name of *strychnism*,*—that is to say, an extremely exaggerated condition of the deep reflexes; and it also bears some resemblance to the "hypertonic paresis" described by Dr. Hughes Bennett some years ago.† The condition is probably due to a hyperexcitability of the grey matter in the anterior horns of the cord. It is probably this same hyperexcitability which gives rise to the increased knee-jerks observable in the great majority of cases of hysterical paralysis, at least in my experience, whether the limbs be flaccid as in this case, or rigid as in two of the cases you have already seen. This man was cured by the three means I have related to you, and he left after a few months' treatment in the infirmary to resume his work, although he had been paralysed for the long period of twenty-four years.

Hysteria in the male differs somewhat from the disease as it occurs in the female in four respects. In the *first place*, heredity seems to play a far more potent part in male hysteria. This is not altogether surprising, because in the female no heredity is needed to explain the disease. For all women as a sex may be said to be born with a certain element of hysteria in their constitution. However, in male hysterical patients careful inquiry never fails to elicit a neurotic history, generally on the mother's side. Whereas, some deny heredity any part in the causation of hysteria in the female.‡ *Secondly*, male hysterical subjects are almost always of the melancholy type. Look at these seven photographs of male hysterical patients. What a sad expression they have ! Males suffering from

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* ' Clin. Soc. Trans.,' vol. xxii.

* " Clinical Lectures on Diseases of Nervous System," vol. iii, pp. 37, 113, 119.

† ' Brain,' parts 34 and 38.

‡ See Hilton Fagge's ' Principles and Practice of Medicine.'

this disorder very seldom exhibit the exuberant spirits, nor that alternating tendency to gaiety which the females do. They seem rather to be perpetually bearing on their shoulders all the cares of Christendom, just as did my unhappy patient H—, without intermission for twenty-four years! *Thirdly*, the symptoms of which they complain, whatever they may be, have a greater tendency to permanency. In spite of the cases I have shown you to-day, there is undoubtedly, in most hysterical symptoms in the female, a tendency to evanescence, ability to change both in character and degree. But in men this is not the rule. *Fourthly*, men show a greater tendency to have "attacks" of some kind —syncopal, palpitation, trembling, convulsions, &c., just the same in kind as women do, but they are more constantly present in the sterner sex. *Fifthly*, in the ætiology traumatism very often figures in the histories of male subjects, and determines both the outbreak and the seat of symptoms presented.

As regards the *prognosis* of hysteria in the male, since this depends in general terms on the duration of the symptoms, and is also worse in the melancholic than the joyous type, and further is less favourable when there is a marked history of heredity, it is certainly less favourable on the whole in the male than the female.

The *treatment* in both sexes is much the same, but greater patience is often required in dealing with the disease in the male sex. Hysteria is, however, an eminently curable affection, and that is why I am glad to have had an opportunity of bringing the matter under your notice to-day.

In conclusion, gentlemen, the chief difficulty as regards hysterical neuro-muscular phenomena is the difficulty of diagnosis from organic lesions. This difficulty is only equalled by the importance of recognising the condition, because the prognosis and treatment are so diametrically opposite in the functional and organic cases. Nevertheless, if the four clinical features to which I have directed your attention be borne in mind, I think the task will be rendered easier. The absence of definite physical signs of an organic lesion; the incompatibility of all the symptoms with a single organic lesion; the special characters attaching to the leading symptoms of the case; and finally, the presence of some at least of the five hysterical stigmata mentioned, will generally enable one to

come to a conclusion. In nearly all cases, as we have seen to-day, these tests can be applied. They will form some guide to help us in the difficult task of diagnosis; but it has always struck me that in this matter that the malady hysteria very much resembles woman herself. Woman, therefore, is the prototype on which this disease is fashioned, and of her Pope truly says—and the same words would apply equally well to the disease in itself—

> " And yet, believe me, good as well as ill,
> Woman's at best a contradiction still."

On the other hand, it must not be forgotten that an organic lesion may arise in an hysterical subject. The danger of confusing such cases with purely functional ones can only be avoided by a thorough systematic examination of the case; but it must be admitted that this is one of the most difficult problems with which a physician can be called upon to deal. However, we ought at all times to treat these cases with as much consideration and kindness as cases of organic disease, because the malady hysteria—to which name, unfortunately, a species of opprobrium has come to be attached—is as real a disease to the sufferer as scarlatina or gastric ulcer, sometimes, I believe, even more real; and, though it may perhaps have arisen through faulty education or over-self-indulgence, it is no part of our *rôle* to sit in judgment; to us rather belongs the privilege of enabling these sufferers to start a new era in their lives. At any rate it is only by our help that the patients can rid themselves of these troublesome symptoms. Moreover, one of the first steps towards rendering them that help is to secure their sympathy and confidence, for, how otherwise than psychically can we treat these psychical complaints?

NOTES.

Prescribe Alcohol, not Whisky.—In the 'Journ. of the Amer. Med. Assoc.,' August 21st, 1897, is an article by Davis on the therapeutic properties of alcohol, and the reasons why the fermented and distilled liquors used as beverages should not be recognised in the Pharmacopœia as medicinal agents. All the possible beneficial effects to be obtained from them may be derived from a suitably diluted alcohol, and by prescribing

this, instead of wine, beer, whisky, and brandy, the doctor knows exactly how much alcohol he is administering—something which is impossible if the beverages are employed, as the percentage of alcohol in them is subject to such wide variations. Besides, all these liquors contain other substances, many of which are injurious, and which may be excluded if the plan advocated is adopted. Moreover, there is considerable saving of expense to the patient. Consequently, it is far more economic, as well as more accurate, for every physician to prescribe pure alcohol and water, to be administered with such quantity of sugar, milk, or meat broth, as in his judgment is required. It would be a very great step in advance, if in the next revision of the Pharmacopœia, only alcohol of standard strength should be retained, to the exclusion of all fermented and distilled liquors. If these changes were adopted and carried into general practice, the result would be a more complete separation of both pharmacist and physician from connection with, or responsibility for, the sale or use of the various popular alcoholic beverages.

Medical News, November 6th, 1897.

Multiple Primary Neoplasmata. — Walter concludes, after reviewing the literature, that multiple primary neoplasmata are due to varying factors. Many arise from carcinomatous implantation, as observed in the peritoneum, stomach, intestine, vulva, and lips. Some occur through regional operative dissemination. Bilateral carcinomata occur symmetrically in paired organs like the mammæ and ovaries, but are not histologically the same necessarily; multiple primary carcinomata of the skin and alimentary canal, multiple primary sarcomata of various organs, combinations of various tumours in the same organ, these multiple primary carcinomata are explained by cancer-cell implantation, by multiplicity of irritant factors, by multiplicity of the neoplastic deposits. Coincidence of sarcoma and carcinoma must at present be regarded as accidental.

Arch. für Klin. Chir., Bd. iii, Heft 1.

Lactic Acid in a Case of Arthritis Deformans.—Zolotavine ('La Méd. Moderne,' September 18th, 1897) used lactic acid with success in an old case of arthritis deformans, administering

daily 10 drops of this drug upon an empty stomach, and allowing no food for an hour and a half afterwards. The disease had lasted for ten years, and for a year the patient had not been able to leave her bed. The dose of the medicine was gradually increased to 40 drops daily. At the end of three weeks the action of the acid was manifest; the articular pains were so relieved that the woman was able to get out of bed and walk a little; the circumference of the joints diminished slightly; nutrition improved, and abdominal pains disappeared. No other medicine was used, and the only external treatment was a light massage. Improvement continued until the patient, at the time of writing, could walk without a cane, and attend to her ordinary occupations.

Medical News, October 30th, 1897.

Congenital Pylorus Stenosis in Infancy.— Dr. H. Finkelstein ('Jahrb. für Kinderh.,' xliii, 1, 1896) says the congenital pylorus stenosis is not so rare as might be expected. He has collected ten cases from the literature, and reports the following case :—A female child 3 months of age suffered from frequent vomiting and became markedly atrophic. In the epigastric region a sausage-shaped tumour could be observed at times, which lay transversely; slow peristaltic movements occurred over the tumour. The child died after these symptoms had continued unabated for some time. A probable diagnosis of congenital hypertrophic pylorus stenosis was made and confirmed at the autopsy. The thickening of the stomach wall in the region of the pylorus involved all the coats, particularly the muscularis mucosa. The reporter believes that a congenital pylorus stenosis existed, in consequence of which a stagnation of the stomach contents was brought about, which in turn caused dyspeptic symptoms and catarrhal affection of the gastric mucosa. The swelling of the mucous membrane increased the degree of stenosis; the inflammation which involved the wall of the stomach led to atony and dilatation of the organ.

Medicine, November, 1897.

Orchitis.—Use an ointment composed of one part guaiacol to six of vaseline.

CONTENTS.

* Specially reported for The Clinical Journal. Revised by the Author.

AN ADDRESS

ON

TUBAL GESTATION,

With Special Reference to its Early Diagnosis and Treatment.

Delivered before the Oxford Medical Society, November 12th, 1897, by

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Obstetric Physician to St. Thomas's Hospital, President of the Obstetrical Society of London, &c.

GENTLEMEN,—I am very sensible of the honour you have done me in asking me to address you this evening. It is natural that one should feel a little nervous on such an occasion, and especially when the address is to be given in a city like Oxford, whose pride and glory it is that all her traditions are connected with the acquirement and advancement of learning, and in whose streets a timid stranger like myself sees in every member of the University that he meets an Admirable Crichton either *in esse* or *in posse*. But I am nevertheless comforted by the reflection that in this Society I shall be addressing members of my own profession, who, however learned they may

be, are sure to be forbearing and friendly in their criticism, and to look upon my remarks with the lenient eyes of those who know how much is uncertain in medicine and how difficult it is to expound a medical subject with clearness and yet without undue dogmatism.

I have chosen for this evening's address the subject of ectopic gestation, partly because I thought it would be of general interest to the members of this Society, and partly because I have happened to have under my care a somewhat unusual number and a great variety of cases, and have thus been enabled to test, by actual and repeated observation, some of the current opinions and teaching. Until a very few years ago, ectopic gestation was considered to be a rare condition, almost a curiosity. This is one of the many erroneous opinions that modern abdominal surgery has swept away. It is now known that the condition is one of frequent occurrence. Its recognition, therefore, has become a matter, not of merely academic interest, but of great, and indeed vital, importance. My own experience of cases in which the diagnosis has been verified by operation, —and it is only cases that have been verified by actual inspection and handling of the parts concerned that are of any scientific value,—includes up to the present time forty-two instances of early ectopic gestation, and seven advanced cases, making together forty-nine cases. By advanced cases I mean cases in which the fœtus has survived to an age at which, if rescued from its dangerous position and born alive, it would be capable of continued independent existence. As I do not purpose to detain you this evening by a consideration of advanced ectopic gestation with its many difficult problems of diagnosis and treatment, I merely call your attention to the table before you, and shall now dismiss for the present that part of the subject, confining myself in what follows to the more numerous class of early cases.

The impregnated ovum may be detained in any part of the Fallopian tube. The most usual position of a tubal gestation sac is the outer half of the tube, but occasionally it is found in the

CASES OF ADVANCED ECTOPIC GESTATION OPERATED UPON.

Child Living.

No.	Date of Operation.	Period of Pregnancy.	Result to Mother.	Result to Child.	Reference to Published Case.
1	Jan. 13th, 1894.	9 months.	Died.	Lived.	'Brit. Med. Journ.,' Dec. 22nd, 1894.

Child Dead.

No.	Date of Operation.	Age of Foetus at its Death.	Interval between Death of Foetus and Operation.	Condition of Child.	Result to Mother.	Reference to Published Case.
1	July 2nd, 1875.	7 Months.	5 Months.	Decomposed.	Died.	'Obst. Journ. of Gt. Brit.,' Oct., 1875.
2	Nov. 10th, 1875.	8 ,,	4 ,,	,,	,,	,, ,, Jan., 1876.
3	Aug. 16th, 1888.	8 ,,	8 ,,	Not decomposed.	Lived.	'Trans. Obst. Soc. Lond.,' 1888, p. 480.
4	April 1st, 1890.	8 ,,	1 Month.	,,	,,	,, ,, 1893, p. 155.
5	Oct. 3rd, 1892.	8 ,,	1 ,,	Decomposed.	Died.	} 'Clin. Journ.,' Mar. 27th,
6	Feb. 1st. 1895.	9 ,,	1 ,,	,,	,,	} 1895.

inner straight portion or isthmus, and still more rarely in the intra-mural portion of the tube, when it forms the variety known as interstitial or tubo-uterine pregnancy. It is this occasional arrest of the fecundated ovum within the wall of the uterus itself that led Dr. Robert Barnes to object to the term extra-uterine as not embracing all the cases of that have been described as abdominal pregnancy are simply cases in which the foetus has escaped from the tube into the peritoneal cavity by primary or secondary rupture, and continued for at least a time to live and grow there; whilst the cases classified under the head of ovarian pregnancy are really tubal pregnancies, in which the compressed
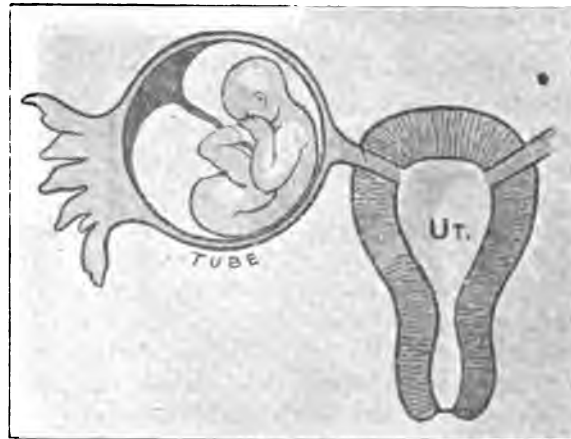
Fig. 1.—Gestation sac in tube. (Diagrammatic after Auvard.)

abnormally situated gestation. He proposed to substitute the word ectopic for extra-uterine, as being more strictly correct; and this term has since been widely adopted (see Figs. 1 and 2).

It is now generally held that Mr. Lawson Tait was right when he declared that every case of ectopic gestation was primarily tubal. Those cases and flattened-out ovary has become closely incorporated with some part of the outer wall of the gestation sac, and so has furnished misleading microscopic evidence of the existence of ovarian tissue in the sac wall.

With regard to the causes of tubal pregnancy we are as yet completely in the dark. It has been

stated by a high authority, and the statement has been so frequently repeated that it has almost come to be accepted as a well-ascertained fact, that this condition only occurs when there has been desquamative inflammation of the mucous lining of the tube. Observation, however, has shown this theory to be untenable. It is true that in some specimens evidence of old tubal inflammation has been found, but it is an exceedingly rare event to meet with desquamative endo-salpingitis, whereas, if this theory were true, it ought to be met with frequently. Another cause that has been assigned is mechanical obstruction, either from narrowing of the tube or otherwise. But, as Mr. Bland Sutton has remarked, we should, if this theory were true, find tubal pregnancy occurring most

ætiology, we may proceed to consider what happens when an impregnated ovum is thus arrested. On this point our knowledge is in a much more satisfactory stage. We know at least *something* about it, and every year is adding to our knowledge. When the Fallopian tube becomes pregnant, there is at once excited great vascular activity in that part of the tube where the ovum has become engrafted. All the tissues composing the tube-wall share in the hyperæmia. As the ovum grows, the walls of the tube become stretched and thinned, and the mucous membrane loses its folds. The abdominal end of the tube is differently affected according to whether the pregnancy has taken place in the outer or inner portion of the tube.
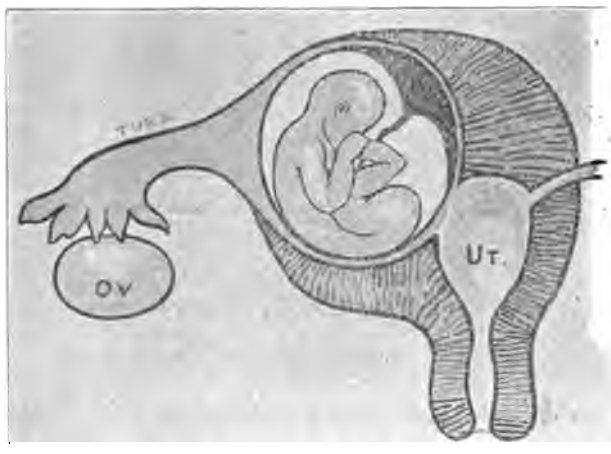
Fig. 2.—Interstitial or tubo-uterine pregnancy. (Diagrammatic after Auvard.)

frequently in the narrowest and most easily occluded portions of the tube, namely, the isthmus and the intra-mural portion. But pregnancy in those parts of the tube is rare. The gestation sac is found most frequently in the widest portion of the tube— namely, the ampulla. The fact is that we do not as yet know with certainty where the impregnation of the ovum *normally* occurs—where the spermatozoon and ovum *normally* meet. As Mr. Bland Sutton has pointed out, it may be that the normal meeting-place is not the Fallopian tube but the interior of the uterus, and that when the ovum becomes impregnated before reaching the uterus, the process is abnormal, the fecundated ovum being arrested in the tube as a consequence.

Leaving, however, these difficult problems of

When the inner half is the seat of the gestation, the fimbriated mouth of the tube is sufficiently far from the scene of activity to remain, as a rule, unaffected. But in the much more common event of the gestation occurring in the outer half of the tube, the abdominal ostium almost invariably becomes closed between the sixth and eighth week, provided the gestation continues to that date without interruption. Previous to that, the effect of the pregnancy is not unfrequently to cause abnormal expansion of the mouth of the tube. I have seen it under such circumstances quite an inch in diameter. It is necessary to lay stress upon these changes, as they help to explain certain concurrent and subsequent events.

Concerning the ovum itself, I think I may say that the general belief is to the effect that the usual course is for development to continue until the tube has become stretched to its utmost limits, when, as the result of some comparatively insignificant strain, rupture occurs, and a hæmorrhage ensues, which in the majority of cases is abundant and tends towards a rapidly fatal issue. It is also part of the current teaching that, in a certain proportion of cases, the hæmorrhage consequent upon the rupture, being less abundant, results in the formation of a pelvic hæmatocele, and that the majority of pelvic hæmatoceles originate in this way, the tendency in these milder and exceptional cases of rupture being towards the ultimate absorption of the extravasated blood, and the recovery of the patient.

occurrence, in the course of a tubal pregnancy, of a condition of the ovum closely akin to that often met with in the course of an ordinary intra-uterine pregnancy, and known as a fleshy or carneous mole. Observation has since shown that what was then regarded as an exceptional occurrence is in reality the most common of all the modes in which a tubal gestation may terminate. The abnormal conditions surrounding a tubal gestation sac render it far more prone to hæmorrhages within and around it, than is the gestation sac of a normal intra-uterine pregnancy. These hæmorrhages may and often do occur very early in the pregnancy, often before the end of the first month. The blood is poured out into the space at that time existing between the chorion and amnion—the subchorionic space, the usual

Fig. 3.—Fallopian tube distended with blood-clot. (*Ad naturam* from a drawing by R. E. Holding.)

Now in this teaching, of which I have here only attempted to give the main outline, there is an element of truth, but there is also a considerable admixture of error. It is a great step in advance to have come to recognise that, save in the rarest and most exceptional cases, pelvic hæmatocele is in some way or another connected with and the result of tubal gestation, and that the bewildering variety of causes that used to be enumerated is for the most part mythical. So far, so good ; but the new teaching is erroneous in this, that it ascribes to rupture a position it does not really occupy, namely, that of being the most common mode of termination of a tubal gestation ; and secondly, that it assigns, as the ordinary cause of rupture, the inability of the tube longer to accommodate the growing ovum.

In 1889 the attention of the profession was called by Mr. Bland Sutton to the occasional

results being the distension of the sac by effused blood, the compression of the amnion and its cavity by the extravasated blood, the destruction of the life of the embryo, and the provoking of external hæmorrhage in addition to the internal as a consequence of the disturbed relations of the ovum with the tube wall. When an early tubal gestation undergoes rupture, it almost invariably does so, not as the mere consequence of the failure of the Fallopian tube to adapt itself to the needs of the growing ovum, but owing to the occurrence of such a series of events as I have just enumerated. The sudden increase in the size of the ovum caused by hæmorrhage puts a new and sudden strain upon the already thin and stretched tube wall, and a covering that might have been quite capable of adapting itself to the gradual and uncomplicated increase in size of a developing ovum, gives way under the more sudden strain

occasioned by the formation of a tubal mole. This is the ordinary mode in which rupture is caused. A slight effort or a slip in walking may determine the precise moment of rupture, but the main cause is the more or less sudden demand made on the capacity of the tube by the occurrence of hæmorrhage between and outside the fœtal membranes.

But my experience goes to show, and the experience of others accords with it, that although the formation of a tubal mole is of very common occurrence in tubal gestation, rupture is not by any means the necessary result, and that there are modes of termination which are much more common than rupture. I have already pointed out that the abdominal ostium of the pregnant tube remains open until the sixth to the eighth week ; and that in cases where the ovum is situated in the inner half of the tube, it does not usually even then become closed. So long as the abdominal ostium remains unclosed, there is obviously a way of escape for blood effused within the tube ; and, as a matter of fact, the blood extravasated as a consequence of the formation of a tubal mole in the earliest weeks of gestation usually finds vent in this direction. Rupture is not unknown even when the abdominal ostium is open, but the risk of rupture is enormously lessened under those circumstances, and the number of cases in which it occurs is comparatively very small. After the abdominal ostium has become closed, the risk of rupture becomes greatly increased, and it is then that most instances of rupture are met with. As a rule, the blood that finds its way out of the tube through the unclosed abdominal ostium is poured out slowly and in small quantity. It is a gentle stream or even a mere trickle. This gives time for the formation of a pelvic hæmatocele, and the immense majority of cases of pelvic hæmatocele originate in this way.

It is commonly taught that pelvic hæmatocele is usually due to *rupture* of a tubal gestation. I have shown in an address recently delivered at Nottingham, and published in the 'Lancet,' that, so far at least as my own experience goes, that is not the fact. I was able, on that occasion, to point out that of twenty cases of pelvic hæmatocele in which the source of the hæmorrhage had been actually verified by operation, eighteen were instances of bleeding from the open mouth of a pregnant

Fallopian tube, and only one was a case of rupture. During the seven months that have elapsed since that address was delivered, I have had five additional cases of operation for pelvic hæmato-. cele. In not one of the five had rupture occurred. All were instances of hæmorrhage from the open abdominal ostium of a Fallopian tube in which there had been formed a tubal mole. So that the figures now stand thus : of 25 cases of pelvic hæmatocele in which an opportunity occurred of verifying by actual inspection the source of the bleeding, 23 were instances of hæmorrhage from the open abdominal ostium of a pregnant Fallopian tube, and only one was due to rupture. The remaining case was altogether exceptional. The blood was derived in that instance from the rupture of a blood-containing cyst of the broad ligament, though, curiously enough, even in that case the hæmorrhage was connected with tubal gestation, for the Fallopian tube on the side opposite to that on which the cyst had given way contained a tubal mole. I merely mention this, however, to account for the case that does not come within either of the two main categories. The figures I have given are from my own practice only, but other observers both in France and in Germany and in this country have expressed similar views and published cases in support of them. I may specially mention, as being in agreement with me on this point, Mr. Bland Sutton and Mr. J. W. Taylor of Birmingham, both of them men of accurate observation and large experience in this department of work. The reason why rupture is so seldom associated with hæmatocele is obvious. The condition necessary for the formation of a hæmatocele is that the blood shall be poured out sufficiently slowly to give time for encapsulation either by adhesions around the effusion or the formation of a firm wall of clotted blood at its periphery. This condition is seldom present in a case of rupture. When a rent in the tube occurs, the hæmorrhage is usually very sudden and very copious. There is no time for the blood to collect in one spot and become surrounded by adhesions or a wall of blood-clot. It is poured out as an unlimited effusion into the peritoneal cavity. Hæmatocele resulted in only one out of the ten cases of rupture of an early tubal gestation in which I have operated, whilst in no fewer than

seven cases the blood was freely effused in the peritoneal cavity.

Before passing on to speak of the various forms of rupture, I may just point out that occasionally the mole itself, with the ovum embedded in it, is discharged along with the stream of blood that issues from the open mouth of the tube. This has been spoken of as a complete tubal abortion. An instance occurred in my own practice, and is represented in one of the drawings before you (Fig. 4). In that case a firm clot was found just outside the mouth of the tube. On opening the clot an amniotic cavity was exposed, and lying within it was a three weeks embryo. Usually, however, the mole remains within the tube and adherent to the tube wall. The condition is then that of a *threatened* tubal abortion. And just as a woman is exposed to the constant risk of re-

cases, *i. e.* in nearly 62 per cent., was the formation of a pelvic hæmatocele; in the other two cases the blood was found freely diffused in the peritoneal cavity.

CASES OF EARLY TUBAL GESTATION OPERATED UPON = 42.

	Cases.
Tubal mole, without rupture or hæmorrhage external to the tube	6
Tubal mole, with hæmorrhage from the free end of the tube	26
Rupture of the gravid tube	10

The next most frequent mode of termination of an early tubal pregnancy is by rupture. This occurred in ten of my cases, *i. e.* in about 24 per cent. As you are aware, rupture may take place either in that larger portion of the circumference of the Fallopian tube covered by peritoneum
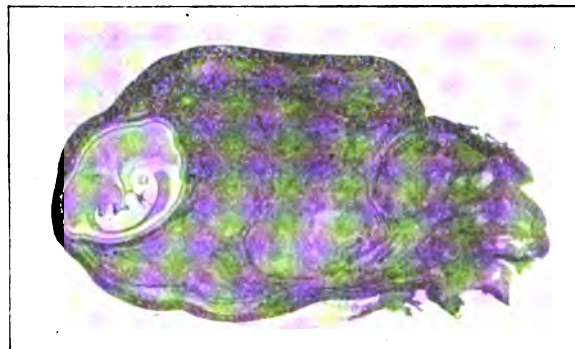
Fig. 4.—Clot and ovum from a complete tubal abortion. (From a drawing by R. E. Holding.)

current hæmorrhages whenever an ordinary intra-uterine mole is retained and adherent within the uterine cavity, she is exposed to a similar risk of repeated hæmorrhages when a tubal mole is retained.

I must apologise for having detained you so long with this part of the subject. My excuse is that the phenomena I have been describing occur with great frequency, and constitute the most common of all the modes of termination of tubal gestation. In my own experience it is certainly so, as the table before you sufficiently shows. The total number of cases of early tubal gestation on which I have operated up to the present time is 42. Of these, no fewer than 26 were cases in which hæmorrhage had occurred from the free end of the tube. The result in 24 out of the 26

(Fig. 5), or in that smaller portion of its circumference in relation with the connective tissue of the mesosalpinx (Fig. 6). In the former case the rupture takes place directly into the peritoneal cavity; in the latter case it takes place into the connective tissue of the broad ligament. Both varieties of rupture are usually accompanied with hæmorrhage, and this hæmorrhage may be and often is of the most formidable character. The most terrible cases are those in which the rupture takes place directly into the peritoneal cavity, and where large vessels are injured. When the rupture is intra-ligamentous, the space at the disposal of the effused blood is limited, and the immediate danger to life is not so great. Out of my ten cases, rupture occurred into the peritoneal cavity in nine, and into the connective tissue of

the broad ligament in one only. Of the nine intra-peritoneal ruptures, one was by some rare chance unaccompanied with hæmorrhage, another was attended with hæmorrhage so moderate in amount that a hæmatocele was formed, whilst in the remaining seven the blood was found free in the peritoneal cavity.

So far, then, as the evidence afforded by my own individual experience extends, the ordinary result of rupture of a tubal pregnancy is free hæmorrhage into the peritoneal cavity, the occurrence of hæmatocele (as a result of rupture) being quite exceptional.

Where the hæmorrhage attending the rupture is insignificant in amount, the embryo may escape through the rent and may continue to live. This may happen whether the rupture be upwards into the peritoneal cavity or downwards into the broad ligament. In the former event the case becomes one of abdominal pregnancy, in the latter the pregnancy is henceforward spoken of as intra-ligamentous. In either case the chances of the child living to a viable age are small. This is abundantly proved by the small number of cases
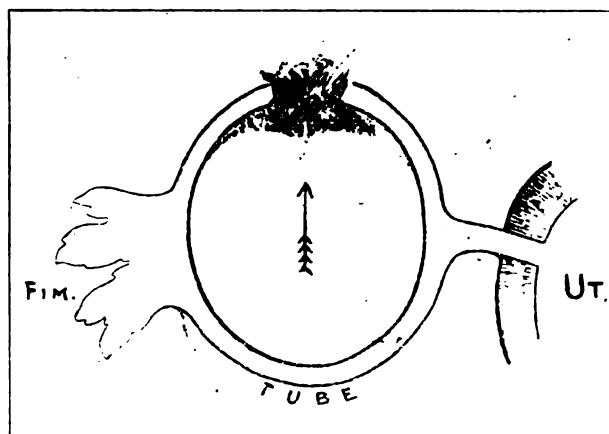
Fig. 5.—Rupture into peritoneal cavity. Primary peritoneal rupture.
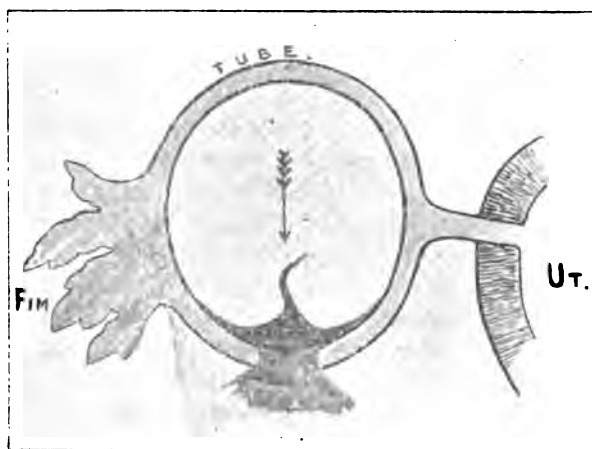
Fig. 6.—Rupture into connective tissue of the mesosalpinx. Primary extra-peritoneal rupture.

of advanced ectopic gestation met with as compared with the number of cases in the early months. And the difference is even greater than appears at first sight, for whilst every case of advanced ectopic gestation is recognised sooner or later, many cases of early tubal gestation, especially those which terminate within the first few weeks in tubal abortion and hæmatocele, are

not diagnosed, and therefore escape unrecorded. Let me take the cases in my own practice by way of illustration. It will be seen from the table before you that I have operated seven times for advanced ectopic gestation. The number of my operations in the early months, as I have already stated, is forty-two. At first sight it would therefore appear that the proportion of cases terminating early to cases going on until a viable age has been reached has, in my practice, been as six to one. But such a conclusion would be erroneous. The cases of advanced ectopic gestation in the table cover the whole extent of my hospital experience, a period of over twenty-four years, and may be held to include every case that came under my care. It is not likely that any case was unrecognised or overlooked. But the table of early operations covers a much shorter period. The first case occurred in 1889, so that all the forty-two cases have been observed within the last nine years. It is morally certain that in the preceding years a certain number of cases came under my care and passed without recognition. At that time scarcely anyone thought of operating unless the indications were singularly clear, and our very imperfect knowledge of the subject prevented most of the cases from being diagnosed. There is still another fallacy in the comparison. The cases tabulated include operation cases only. No others are available for the purposes of such an inquiry as the present. The element of certainty is wanting. But many cases of pelvic hæmatocele occurred in my practice in which no operation was performed. At least the majority of these may fairly be considered to have been due to an early tubal abortion. Yet they are of necessity left out of account. So that the real proportion of my cases of ectopic gestation in which the child lived to a viable age is much smaller than the tables might at first sight lead one to infer.

There is still another group of cases to be mentioned, a smaller group than the other two, but one, nevertheless, possessing considerable interest. I allude to the cases where the vitality of the ovum had been destroyed by the formation of a tubal mole, but where the result was simply a hæmatosalpinx without hæmatocele and without rupture. In most of these cases, no doubt timely intervention saved the patients from the perils of rupture. One of the cases was of singular interest.

A drawing taken from the museum preparation is before you (Fig. 7). The specimen is in longitudinal section. The Fallopian tube was greatly distended, and filled with clotted blood. At one end of it there was a sausage-like excrescence clinging to, and as it were embracing the rounded extremity of the tube. On closer inspection this excrescence was seen to be a fœtus enclosed in a thin sac, through the wall of which the bones of one of its limbs were protruding. I thought at first the sac would prove to be the amnion, and that the fœtus had effected a bloodless escape through a rent in the tube-wall. But on careful dissection the sac was found to be a sort of diverticulum of the tube itself, communicating with the main cavity of the tube by means of a small aperture, through which the embryo had passed, rupturing its funis in the process, and leaving the placenta behind. The section is made through the vertebral column of the fœtus, and shows the cranial cavity at one end, and the displaced ribs lying over the lower part of the spine.

I must not, however, forget that I have undertaken to speak more particularly of the diagnosis and treatment of early tubal gestation. With regard to the diagnosis of this condition in cases where as yet there has been no hæmorrhage within or around the ovum, it can only be by a happy accident if the abnormal gestation is discovered. The diagnosis would then rest upon the co-existence of amenorrhœa and other symptoms of pregnancy, along with the physical signs produced by an enlarged Fallopian tube, and a slightly enlarged (but empty) uterus. A good many instances have now been recorded as having been diagnosed "before rupture," but, so far as I know, all of them have been cases of tubal mole. In such cases the diagnosis is easier. For, in addition to amenorrhœa and a tubal swelling there are usually also pain and irregular hæmorrhage. The pain comes on suddenly, and is at first very severe; but it soon abates, and in a few hours passes off altogether for the time. It is ordinarily situated in the lower part of the abdomen, a little to one side of the middle line. The pain often recurs, the recurrence being in all probability due to fresh hæmorrhages. It is not a constant symptom. For example, in the case I was describing a few minutes ago, where there had been a large amount of hæmorrhage within the tube, and where the

fœtus had found its way through a narrow opening into a pouch of the tube-wall, the patient had no pain or interference with the general health throughout. This is very remarkable, and deserves to be noted.

The irregular hæmorrhages are of very great importance in the diagnosis. They are probably due to two causes—first, the irritation of the presence of a tubal mole in a part of the tube that

in amount, thickish in consistence, and steady in its rate of flow. Gushes of bright red blood occur occasionally, but are quite exceptional. The characters of the discharge that I have just enumerated have not unfrequently been of great assistance to me in arriving at a diagnosis in a difficult case. The condition above all others for which early ectopic gestation with tubal mole is likely to be mistaken is a threatened or incomplete uterine
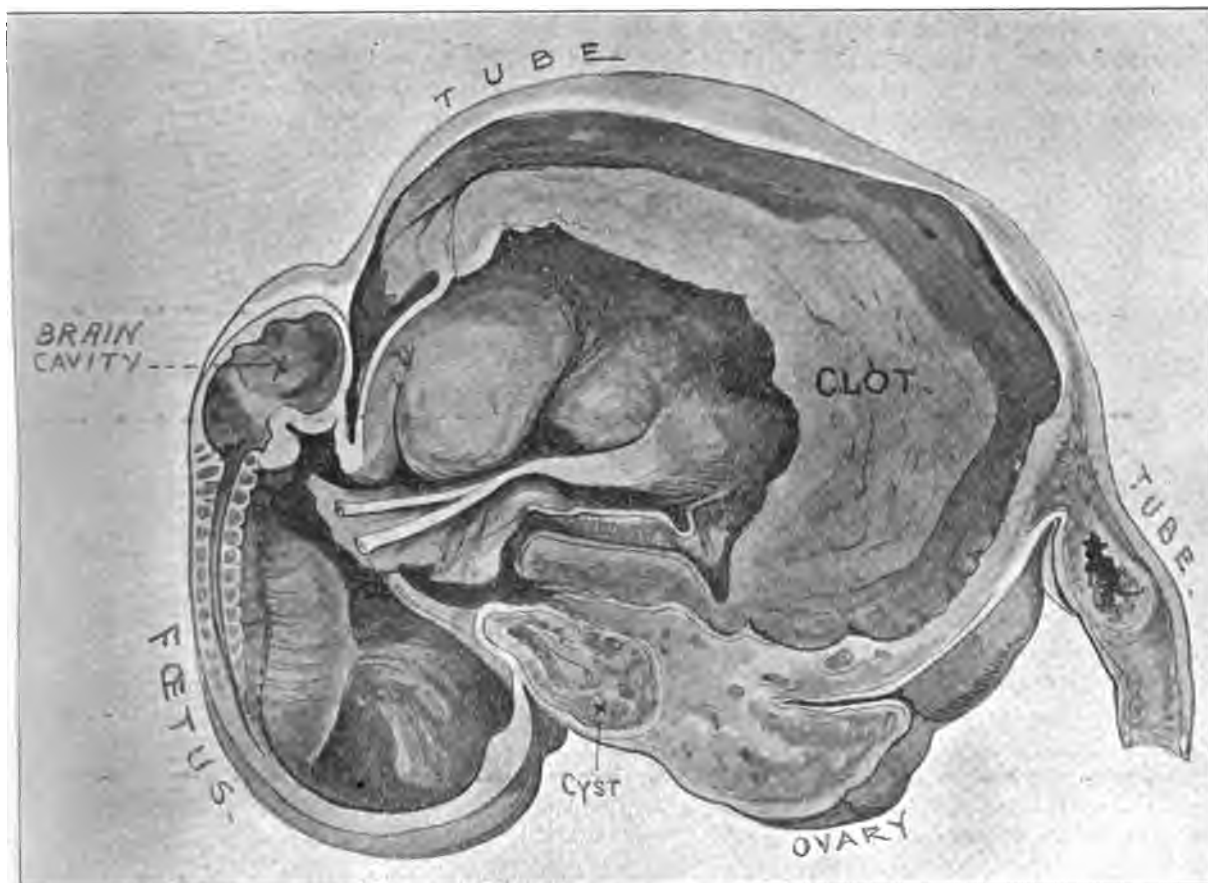
Fig. 7.—Longitudinal section. Unruptured tubal gestation with apoplexy of· ovum.
(*Ad naturam* from a drawing by R. E. Holding.)

has not been entirely cut off from its communication with the uterus ; and, secondly, the efforts on the part of the uterus to dislodge and expel, now that the vitality of the ovum has been destroyed and the pregnancy terminated, the decidual membrane that is invariably formed within its cavity in every case of ectopic gestation. There is a peculiarity about these hæmorrhages that, so far as I know, has not hitherto received attention. *The blood is almost invariably dark in colour, moderate*

abortion. The two important points in distinguishing the one condition from the other are—(1) the presence or otherwise of an abnormal swelling in the situation of one of the Fallopian tubes ; and (2) the character of the blood discharged *per vaginam.* In the hæmorrhage due to threatened or incomplete uterine abortion the discharge is often very copious, fitful in its rate of flow, and variable in its colour and consistence. In some cases of incomplete abortion it is, of

course, highly offensive, which the uterine discharge in a case of ectopic gestation scarcely ever is.

With reference to the amenorrhœa, when this symptom is present it is of course an enormous help in arriving at a correct diagnosis. But it may be absent, and yet the case may be one of tubal gestation. For the ovum may be of too early a date for the symptom to be available. A mole may have been formed before a menstrual period is due. Hence, amenorrhœa is not a constant symptom, though when present it is of extreme value.

One word must be added as to the tubal swelling. It is generally stated that this is that, namely, on which the tube is enlarged. I have often been greatly helped by this sign. And, lastly, there is the examination of any membrane or membranous débris shed with the discharge. In the case of ectopic gestation such a membrane would consist of the uterine decidua entire or in fragments (Fig. 8). When floated on water it would present no trace of chorionic villi. Whereas in the case of a uterine abortion there would be the fœtal membranes, and the villi of the chorion would be easily recognised.

I have so far dealt with the diagnosis in very early cases of tubal mole, where there has been no hæmorrhage external to the tube. When the
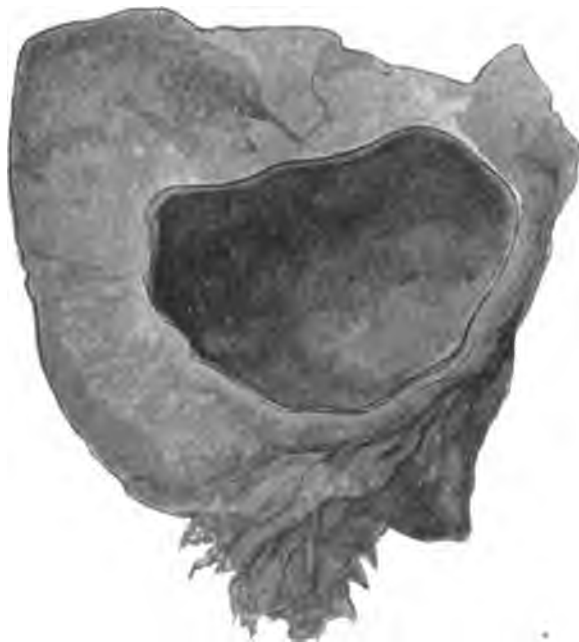
Fig. 8.—Decidual Cast from uterus in a case of ruptured tubal gestation, with window cut to show interior. (From a photograph.)

situated at the side of the pelvis in the fossa behind the broad ligament. This is not always the case. I have repeatedly found it in other situations ; sometimes behind and adherent to the uterus low down in Douglas's pouch, and occasionally above the uterus and adherent to one of its cornua. The possibility, therefore, of the condition being tubal gestation must not be dismissed because the abnormal swelling detected on palpation is not in the situation expected.

Two other diagnostic signs remain to be considered. It is often possible to detect marked pulsation in the vaginal fornix of one side only— gestation has proceeded to a later stage, the presence of some of the ordinary signs of early pregnancy will usually come to our aid—missed menstruation, morning sickness, and breast symptoms. And when hæmorrhage into the peritoneal cavity has occurred, the conditions will be still further altered. The pains will be more violent, and will often be accompanied with pallor, vomiting, rise of temperature, abdominal distension and collapse. As a rule, the first attack occurs between the fourth and eighth week, and other attacks usually follow at intervals of a few days. If the hæmorrhage has been of sufficiently moderate

extent to allow of the formation of a hæmatocele, a careful bimanual examination will reveal the presence of a pelvic swelling behind the uterus, pushing that organ forward, distending the pouch of Douglas, and rising into the abdomen above the level of the pelvic brim (Fig. 9). The upper limit of this swelling will be irregular, and obscured by

given in every text-book. But I should like to take this opportunity of saying that writers do not lay sufficient stress on the importance of distinguishing pelvic hæmatocele from retroversion of the gravid uterus. In both there is missed menstruation, with other signs of early pregnancy. In both the cervix uteri is pushed forwards, and the pelvic cavity is
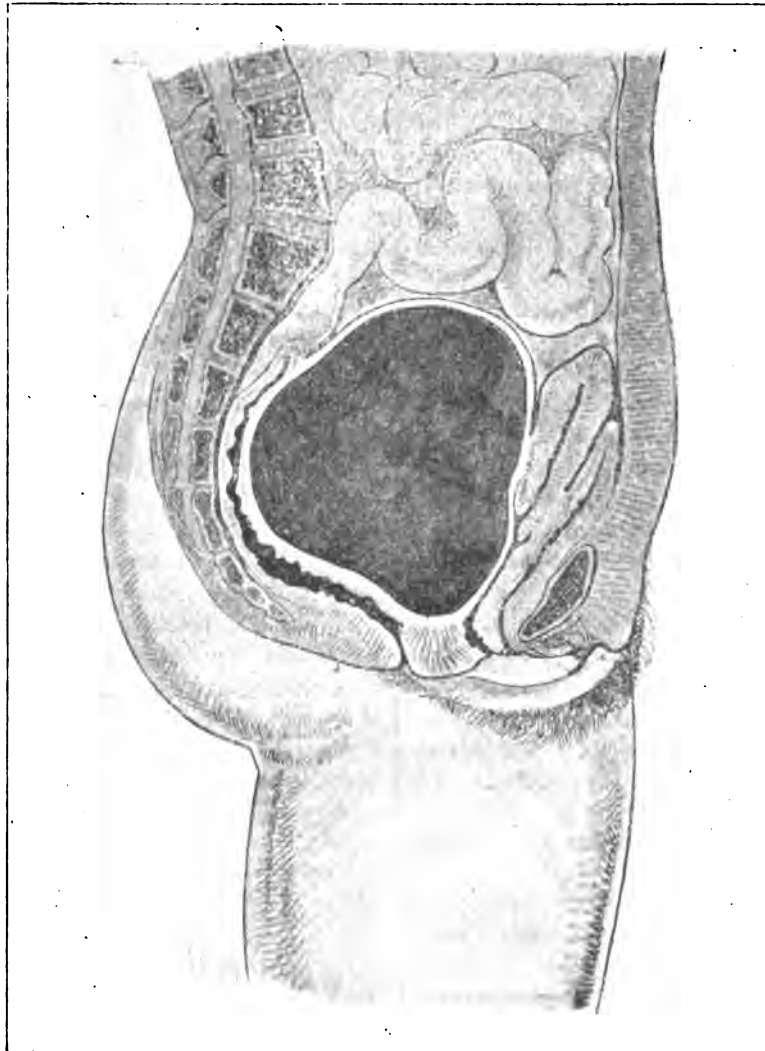
Fig. 9.—Pelvic hæmatocele. (Diagrammatic.)

the abdominal distension. In a few days the intestinal distension usually subsides, and the outline becomes easier to define. It will still, however, be irregular, owing to the varying character of the adherent viscera that form its roof. I do not purpose to detain you with a detailed account of the physical signs of pelvic hæmatocele ; they are

occupied by a soft but firm swelling distending Douglas's pouch, and depressing the vaginal roof. The distinction is important, because serious harm may ensue if an attempt be made to push up a pelvic hæmatocele under the impression that the case is one of retroversion. No other condition is so liable to be mistaken for a retroverted gravid

uterus as a pelvic hæmatocele. I have made the mistake myself, and known it to be made by others. How are we to guard against it? The history will help us. But the one distinguishing sign is the presence in the case of hæmatocele of the body of the uterus lying above the pubes, and in front of the swelling, whereas in retroversion the body of the uterus is, of course, absent from this situation.

It will have been noticed that I included a rise of temperature amongst the more frequent phenomena that characterise the acute attacks of illness in cases of tubal abortion. I believe that it is the non-recognition of this liability for the temperature to rise when internal hæmorrhage is going on that leads to so many cases of tubal gestation with hæmatocele being erroneously diagnosed as cases of pelvic peritonitis. The abdominal pain, the extreme tenderness, and the distension tend further to mislead, and the gradual development of the swelling caused by the formation of the hæmatocele is regarded as a peritonitic exudation. It is remarkable that this question of the temperature has not hitherto received attention. As a matter of fact it is rare to meet with a case of pelvic hæmatocele without at least temporary rises, and sometimes the rise extends to several degrees. I have before me the notes of a case that was under observation for five days before operation, in which the temperature during the whole of that time was never below 99·6°, and was generally much higher, frequently reaching 102°, and on several occasions mounting to 103° and 103·4°. Yet the case was an ordinary hæmatocele, with only the usual amount of adhesive peritonitis, and with no evidence of putrefactive or other morbid alteration of the effused blood.

Another point that appears to me not to be made sufficiently clear in the books is that a pelvic hæmatocele is not always or necessarily central in its position. It is often situated in one or other of the lateral fossæ behind the broad ligament, and limited to the one side, without even encroaching upon the pouch of Douglas at all.

The fact is that the localisation of a hæmatocele, due (as hæmatoceles usually are) to the escape of blood from the open abdominal ostium of a pregnant Fallopian tube, is determined not so much by the influence of gravitation as by the position which the mouth of the tube happened to occupy at the time. The hæmatocele is usually central, because the most common position of the mouth of the tube is in the direction of Douglas's pouch. But it is not by any means always so, and the circumstance of there being no actually central swelling must not blind us to the possibility of the case being one of hæmatocele notwithstanding. I have recently had a succession of cases in which the hæmatocele was unilateral, and the pouch of Douglas empty.

The diagnosis of tubal gestation, with hæmorrhage so profuse that the blood becomes at once diffused into the peritoneal cavity, is based chiefly on the history and on the alarming character of the symptoms. It is in such cases that the pallor is extreme, the pain intense, the tenderness excruciating, and the collapse sudden and severe. The history and the pallor help to distinguish the condition from that due to intestinal perforation or perforation of a gastric ulcer.

I have left myself but little time to speak of treatment. Fortunately, what I have to say can be summed up in a few words. Considering the appalling nature of the risks that have to be encountered by a patient with tubal gestation, and considering the signal success that has attended operative interference in the earlier months (thirty-nine, for instance, out of my own forty-two cases made a perfect recovery), I have no hesitation in proclaiming my strong conviction that, with the exception of some few cases of very early tubal abortion accompanied with hæmatocele, the proper treatment is to operate at once in every case in which the diagnosis of ectopic gestation has been established.

Massage in Chorea.—Fedorov ('La Semaine Méd.,' September 8th, 1897) is well pleased with the results obtained in ten cases of chorea by the use of massage. The patients were children from seven to fourteen years of age. The movements were at first light, then gradually increased in force until the whole body was thoroughly handled. Passive motions followed as soon as the patients were sufficiently calmed to permit them. The beneficial effects of this treatment were evident on the third or fourth day, and at the end of a week an improvement in the general condition was manifest. Fedorov believes that the massage exerts a sedative action on the central nervous system, stimulates the circulation, and so facilitates nutritive exchange, and the elimination of toxins which have accumulated in the organisms.

Medical News.

A LECTURE ON RABIES.

Being one of the Brown Lectures. Delivered at the
University of London, November 16th, 1897,

By J. ROSE BRADFORD, D.Sc., M.D., F.R.C.P., F.R.S.,

Professor Superintendent of the Brown Institution, &c.

IN TWO PARTS. PART I.

SIR SAMUEL WILKS AND GENTLEMEN,—As you
probably know, the Brown Institution was founded
by Mr. Brown mainly with two objects—first of
all for the treatment of the diseases of animals,
and secondly for the investigation of pathological
problems connected with diseases common to
animals and man. Within the last two years
there has been a further work entrusted to the
Brown Institution, namely, the accurate investi-
gation of rabies. So that at the present time the
work of the institution is really divided into three
heads,—the treatment by the veterinary assistant
of the considerable number of animals admitted.
there as patients, the routine investigation of cases
of rabies, and certain research work Mr. Brown
made it a condition of his trust that public lectures
should be delivered annually in connection with
the business of the institution. Therefore I pro-
pose in these lectures to treat of these two latter
subdivisions of the work, namely, the rabies inves-
tigations and the research work.

To-day we will consider the rabies investigations.
I need not dilate upon the importance of the work
both from a veterinary standpoint and also from a
human standpoint. I will simply say that since
this work has been started at the Brown Institute,
and in fact coincidently with my appointment
there, there have been some 273 cases investigated,
and therefore there is a considerable amount of
material available at the present time to give some
evidence as regards some of the questions connected
with rabies. I do not propose to go into the whole
question of rabies to-day, it is too large a subject ;
I propose to consider the diagnosis of rabies in
animals, and, for the matter of that, of that of
hydrophobia in men. It is obvious that the
diagnosis of rabies is one of the most important, if
not the most important branch of the subject.
But before we can consider fully the diagnosis of
rabies we must make a few preliminary remarks
upon rabies itself.

First, rabies is a malady that affects all the
mammalia, but of course more especially the
carnivora, for obvious reasons, i. e. it is easily
communicated by biting. But rabies is not by
any means limited to the carnivora ; it affects both
wild and domestic animals, although from our
point of view perhaps, at any rate in this country,
the outbreaks among domestic animals are by far
the most important. In other countries that is
not so ; in Russia, for instance, and to a certain
extent in France, the outbreaks among wolves are
often very serious and lead to very disastrous
results.

The animals which are most frequently affected
with rabies are dogs, then cats, then wolves
and foxes. Occasionally outbreaks are seen in
cattle, and rarely in sheep and goats. It also
occurs, though rarely, in horses, though when
it does occur in horses it is exceedingly violent.
Then, curiously enough, it is very rare in pigs.
There have been interesting outbreaks, although
not of very great importance, in deer. In this
country there have been three great outbreaks
in deer. There was the great outbreak in the
park at Windsor in 1795 ; there was another
outbreak in the Duke of Westminster's herd in
1872 ; and there was the outbreak, which many
of you are familiar with, in 1886, which Mr.
Horsley investigated, in Richmond Park. The
latter was a very severe one, and many of the
animals were affected. Even in this case it is
probable that the disease originated from the dog,
and that it was then transmitted from one deer to
another by biting. The frequency of rabies in dif-
ferent countries, and even in the same country at
different times, varies greatly. You know that
at the present time it is common in France and
common in Russia. It is rare in Germany, and
it is practically unknown in the large towns of
Germany,—a very striking contrast to the state of
matters in this country. I believe rabies is also
unknown in Australia, and practically unknown
in Norway. In both Australia and Norway it is
unknown mainly owing to the quarantine regula-
tions, particularly in Norway, which render it
difficult or impossible to import dogs.

Having made these preliminary remarks, we
will pass on to consider some of the symptoms,

and we must do so in some little detail before we pass to the diagnosis. The symptoms of rabies in animals depend fundamentally on which of the two clinical types it assumes. There is one form known as furious rabies, and another which is known as dumb rabies. The diagnosis of both of these is occasionally difficult, but perhaps the recognition of the dumb variety is the more difficult of the two. By dumb rabies is meant really the final condition of furious rabies, only the use of the expression dumb rabies is restricted to the class of case in which the initial symptoms of furious rabies are absent, and in which the final symptoms of the malady are alone present. The carnivora are mainly the subjects of furious rabies; rodents, such as rabbits, are the subjects mainly of dumb rabies, and there is nothing more striking than the fact that the inoculation of the same material in one animal will almost always produce furious rabies, and in the other animal will bring on dumb rabies. Furious rabies in the rabbit is perhaps, on the whole, more uncommon than dumb rabies in the dog. Since I have been connected with the Brown Institute, for instance, we have had three cases of furious rabies in rabbits, and two cases of dumb rabies in dogs. There is another very curious fact, the explanation of which is, as far as I know, quite unknown,—that is, the statement, which I believe is accurate, that whereas rabies is fairly common in the East, hydrophobia is very uncommon ; and that is associated with the fact that in the East rabies assumes mainly the dumb form, and that is said to be particularly the case in Turkey, where dumb rabies is asserted to be very common, furious rabies being almost unknown.

We will, then, first consider the symptoms in the carnivora, and first of all the symptoms of furious rabies in them. These I must give you very cursorily.

The first thing to be noticed in the dog, though often it is not noticed at the time but remembered afterwards, is that the animal is restless, and what is described as agitated ; but, in contradistinction to the popular notion, it is quiet, docile, and has no tendency to attack animate or inanimate objects. At this time also the animal is very frequently hyperæsthetic. The important point in the diagnosis is that this agitated restless condition persists, the appetite is good, and there is no

difficulty in swallowing. Then the agitation rapidly increases, and the animal suffers from hallucinations, as is manifested by the way in which it springs into the air as if it saw things ; and at this time it becomes destructive. Still it is not savage,—at any rate, it does not show a tendency to attack its owner. Then very soon the bark becomes affected. It is hopeless to attempt to describe the bark, but it is one of those things that if you once hear you are not likely to forget. First of all it resembles what in the human subject we talk of as stridor, and it is exceedingly prolonged and high-pitched in quality, so that it can be heard at a very great distance,— indeed, it is exceedingly characteristic ; but, unfortunately from a diagnostic point of view, this characteristic bark is often absent. It is dependent on commencing laryngeal paralysis. At this stage of the clinical history of the malady the seat of the bite (for the animal has usually been bitten) becomes irritable, and the animal can very frequently be seen to bite the part which has been bitten. And frequently—so frequently that I may practically say always—the skin at this period becomes anæsthetic, and the dog will not only bite the spot, but may tear itself to pieces or inflict upon itself very severe wounds. At this stage deglutition becomes impossible, and I may here say that there is no period in the history of the disease at which the animal becomes hydrophobic, and the term hydrophobia is therefore a misnomer; it is simply this inability to swallow both solids and fluids. Then the animal becomes really furious and maniacal, and if kept under observation must be confined in a very strong iron cage. At this period of its illness the animal flies at the bars and tries to break them if anyone goes near the cage, thus closely resembling maniacal attacks seen in the human subject. During this maniacal stage it destroys and swallows foreign bodies of various kinds, such as pieces of coal, wood, bone, hair, rags, &c., a point which one lays stress upon in regard to post-mortem appearances. It is a remarkable fact that a dog with rabies rarely bites another dog, at any rate in the early stages, unless the suffering dog has been irritated by the other dog. I may quote a very characteristic instance of that, showing how rabies tends to be spread in the streets of large cities. A certain man, who bred a good breed of fox-terriers (I mention this

point to draw attention to the fact that he was probably quite familiar with dogs), when he went out one day with one of his dogs he noticed it went up to another dog in the street, and that the other dog snapped at it. He thought nothing of it, and thought there was nothing suspicious about the appearance of the snapping dog. The dog belonging to the man I have mentioned developed rabies and bit another dog, which later developed rabies and bit one of this man's relatives. I think that is a most instructive story, showing how a man familiar with dogs did not notice anything wrong with a dog suffering from rabies, and illustrates the fact that cases of rabies may be at large in the streets without biting other dogs unless provoked.

To pass on to the clinical description. After the furious stage the animal becomes palsied, and this palsy usually affects the jaw first; the jaw drops, and the saliva can be seen running out of the mouth. The paralysis rapidly spreads to the extremities, and finally it attacks the respiratory muscles, and the animal dies. The total duration in the dog is usually from four to five days, and that, as we shall presently see, is an important point. It may, however, last a maximum of ten days, and it is said that it may last only two days; but the average duration is four to five days.

Let us now pass on to dumb rabies. In dumb rabies the clinical picture I have just endeavoured to describe is absent. The sensory troubles are not marked, and the only thing observed is that the dog is anxious and to a certain extent agitated. This condition is rapidly followed by paralysis, and the palsy may affect the jaw, or may be a paraplegia, affecting both legs; or it may be monoplegic or hemiplegic in its distribution. Under these various circumstances it may be exceedingly difficult to recognise. It can be fairly easily recognised if it affects the jaw, but not if it is hemiplegic or monoplegic. Of course an animal with dumb rabies is quite unable to bite or swallow, and is not in any way dangerous in the ordinary way, though of course it would be dangerous to examine such a dog's mouth. But it is nothing like so dangerous as a case of furious rabies. The average duration of dumb rabies is two to three days,—very much shorter than in furious rabies.

We will leave out the description of the form of the disease in other animals, such as oxen and horses, except to say that it is a terrible, very dangerous disease in the horse. Few stables are constructed sufficiently strong to withstand the attacks of horses suffering from furious rabies.

Of more importance for our immediate purpose, the diagnosis, is a description of rabies in the rabbit. In this animal it is a remarkable disease, and merits description. In the first place the animal becomes somnolent, and after that it develops, as you probably all know, increasing weakness of the limbs. But the important point, which is apt to be forgotten, is that this is not a characteristic feature. Almost any illness in the rabbit shows itself by weakness or paralysis of the limbs, the rabbit being sometimes unable to stand. The important point is that the palsy of rabies occurs at a time when the general health of the animal is not affected; you will have a rabbit unable to stand when it is still eating well and has not lost much flesh. One lays very great stress on that, because it is popularly supposed that the characteristic feature of rabies in the rabbit is that its hind legs are paralysed, whereas there are very few maladies which can be communicated to the rabbit that do not cause paralysis of the hind legs,—diphtheria, for instance; but these other diseases cause paralysis in the rabbit's legs when there is general marasmus. The other characteristic feature, which many books do not lay sufficient stress upon, is the occurrence of clonic spasms. A rabbit with paralytic or dumb rabies has clonic spasms which resemble somewhat the clonic spasms which are seen in the dog as the result of thyroidectomy. They are violent spasms, and occur at a time when voluntary power over the limbs is impaired. You then have the picture of the rabbit crawling by means of its fore-legs, both of its hind legs stretched out motionless, and the body liable to be convulsed at intervals with clonic spasms. Another symptom, which is not of very much practical importance, but is of considerable scientific interest, is that there is pyrexia, and that the pyrexia occurs before the paralysis. Another symptom of considerable scientific importance is the presence of polyuria, and of glycosuria, interesting when one bears in mind that rabies is to a large extent an inflammation of the bulb. Occasionally one gets furious rabies in the rabbit, and that is much like furious rabies in the dog. One interesting observation which I was able to make, and confirm other

observers, was that one could transmit furious rabies from one rabbit to another. One set of rabbits developed furious rabies from inoculation from a case of canine rabies, and this was transmitted to other rabbits on several successive occasions.

To pass on to other points which concern diagnosis, we will consider the lesions, post-mortem lesions, first of all in dogs. By post-mortem lesions I mean lesions found in those cases in which the animal has *died* of the disease. The mouth and tongue are found very dry, dusky, and congested, and very often there are erosions or slight superficial ulcers, necessarily dependent on the injuries inflicted on the animal during its struggles and biting foreign bodies. The stomach is found to contain no food; that is a very important point. It may be empty or it may be crammed with foreign bodies such as I have mentioned. Of course the presence of bone in the stomach is of no significance, as that is common in dogs. Ecchymoses are frequently present, and there may be actual hæmorrhagic ulcers,—that is to say, erosions, and these may also be present in the intestines, and frequently these are the only definite post-mortem lesions. You will see that really they are not very definite. Other lesions, such as petechial extravasations in the serous membranes, and the blood not being coagulated, which some veterinary surgeons lay stress on, are perhaps more dependent on the actual *mode* of death than on the rabic virus itself.

Lastly, a word or two about incubation. In dogs the incubation period is said to be from fifteen to sixty days, and at least 50 per cent. of the cases occur in less than a month. It is exceedingly rare after 120 days. In cattle the incubation varies from one to three months, and I have been able to find one case in which the incubation period was twenty-three months. In sheep the period is fifteen to thirty days, and in the human subject it is usually six weeks. Therefore the incubation period varies considerably, largely owing to the fact that in what Pasteur called "la rage des rues" the virulence of the disease varies; whereas in the rabies of the laboratory, where you get a virus of a known and definite strength, the incubation varies within fairly narrow limits.

(*To be continued.*)

NOTE.

The Value of Antipyrin in Labour.—The very extraordinary number of ailments in which antipyrin has proved itself useful leads one on one hand to believe all that can be said in its favour, and on the other to doubt the possibility of its proving efficacious in any additional conditions to those in which we already employ it. It is worthy of note, however, that very shortly after antipyrin was first brought forward as a pain reliever several clinicians suggested its use for the purpose of relieving the pains of labour. It is not surprising, therefore, to find that it has been largely used, and that we are now in a position to decide as to its pain-relieving powers in the parturient state. Increasing knowledge of this drug has certainly shown that whatever power for good it has is confined to practically one stage of delivery. It seems hardly necessary to emphasise the fact that it can under no circumstances supplant the ordinary anæsthetics, and it must be remembered that the coal-tar products prove themselves useful in those forms of pain which may be called nerve lesions, and are usually practically powerless in the pains of inflammatory processes. According to the studies of Misrachi it is a useless remedy for the pains of a perfectly normal labour, but finds its chief usefulness in those cases where the pains are so excessive as to reflexly interfere with the proper uterine contractions. In this condition he asserts that it is most efficient. Misrachi decides, too, that it is indicated in tedious labour when the pains are severe. He also believes that it is useful when the liquor amnii has been discharged too early, and where there is rigidity of the os. In regard to the second stage of labour, Misrachi concludes that antipyrin is useless. There is evidence, however, that antipyrin has considerable ability to relieve the so-called after-pains. It is also seemingly a fact that antipyrin may be used with some success for the purpose of quieting a tendency to the development of pains before the full term has been reached. If it is intended to use antipyrin for the purpose of arresting a threatened miscarriage, then its dose must be very large—as much as thirty or forty grains given in two or three doses of fifteen grains each at half-hour or hour intervals.

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* Specially reported for The Clinical Journal. Re-
vised by the Author.

A LECTURE ON RABIES.

Being one of the Brown Lectures. Delivered at the
University of London, November 16th, 1897,

By J. ROSE BRADFORD, D.Sc., M.D.,
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IN TWO PARTS. PART II.

THERE is one other thing we must go into
before we consider the diagnosis in detail, that is
the virus of rabies. It rests on an assertion of
Nocard and Roux, and if this is correct it is a
very important point, that the saliva was found
virulent three days before the affected animal
developed any symptoms. That is, I believe, the
only observation in support of it ; otherwise most
pathologists hold that the saliva is not virulent
until the animal shows very distinct signs of the
disease. Next, when the animal dies from the
natural course of the disease, the virus is found
throughout the nervous system, but as in ninety-
nine cases out of a hundred the animal is killed at
an earlier period of the malady, the virus may
only be found in the medulla. In other words,
the medulla is always virulent, but the entire
nervous system may not be virulent unless the

disease has been allowed to run its ordinary
course.

A matter which always strikes one as very re-
markable is that the blood, the lymph, the muscles,
the liver, the spleen, and the urine are not virulent.
On the other hand, the salivary glands, pancreatic
gland, the mammary gland, and it is said even the
milk, are virulent. If this be true it is very re-
markable that we should have the virus in the
medulla and in the salivary gland, and yet that it
should not be in the blood or lymph circulating in
the body. Another point in connection with the
virus which must be considered in reference to the
diagnosis is what is spoken of as the " resistance "
of the virus. The activity of the virus is lost by
drying ; it is then lost in from a week to a fort-
night, or more exactly from five to fourteen days.
If it is kept wet, on the other hand, it will remain
virulent as long as forty days. A temperature of
50° C. for less than an hour will destroy the virus ;
50° C. is, comparatively speaking, a low tempera-
ture,—about as high as one can stand with the
finger. Sunlight is said to destroy it in fourteen
hours in summer heat. The most important of all
the questions is the influence of putrefaction,
because that is the question which presents itself
most to the investigator. I have collected the
following facts with regard to this question : that
if a carcass be buried entire, the virus has been
found active in the rabbit after twenty-three days,
in the sheep after twenty-one days, in the dog
after forty-five days, and in the wolf after fourteen
days. On the other hand, my own experience at
the Brown Institution has not altogether tallied
with that, and there have been one or two failures
in my inoculation results owing to advanced putre-
faction. Putrefaction is in this country a very
important question with regard to the diagnosis of
rabies. In the summer we have dogs' heads sent
up from all parts of England, and they usually
arrive very putrid, and it is a matter of very con-
siderable importance whether the test can be
carried out under these circumstances. I will re-
turn to that presently.

As regards the inoculability of rabies. The

skin does not absorb the virus (I am speaking now of laboratory experiments). On the other hand, in 50 per cent. of subcutaneous injections the disease is communicated. It is a great mistake to suppose that the disease can only be communicated by subdural inoculations. It is not absorbed by the digestive canal,—that is, if animals eat the flesh or brains of a rabid animal that will not give them the disease, unless of course there is some breach of the mucous membrane of the alimentary canal. The serous membranes do not absorb the virus with great ease ; hence, if you wish to communicate the malady by inoculation, there are four methods open to you, namely, injection into the anterior chamber of the eye, subdural injection, injection into the nerves, or intra-venous injection. With all of these the malady can be communicated with a very fair amount of certainty, the maximum of certainty being reached by the subdural injection. As regards intra-venous injection, the only point I need detain you with is, according to Nocard, intra-venous injection in horses causes immunity, whereas it does not do so in other animals. In the veterinary school at Alfort this method has been used for vaccinating horses.

I now pass on to the diagnosis. First of all let us consider the clinical aspect. The most important fact as regards the clinical diagnosis is that it is probably impossible for anyone, however skilful he may be, to exclude rabies by a single examination ; you cannot say by one inspection of an animal that it has not got rabies. As regards the mistakes that may be made in the differential diagnosis, they are rather numerous, and I will give you a few, speaking only of dogs. First of all enteritis and various forms of intestinal obstruction that occur in dogs are liable to produce symptoms which may be confounded with rabies. Inability to eat may be misinterpreted. The same remark applies to the presence of foreign bodies in the alimentary canal, and that is a mistake that frequently arises. One has had many instances of the impaction of foreign bodies in the throat, the animal being supposed to have dumb rabies. Next, cysticercus in the brain may produce a condition which may be mistaken by the inexperienced for rabies. But undoubtedly the most important error of diagnosis is the presence of epilepsy in dogs, or the epileptiform seizures in

dogs as a result of disease of the meatus. Dogs, particularly long-eared ones, suffer from several diseases of the external auditory meatus, and they are liable to have epileptiform seizures, and in that way errors of diagnosis may arise. There is another which one would not have thought of, but which some authorities give,—the presence of rheumatism. The hyperæsthesia and the pain around the inflamed joints may lead us to error, for a dog may bite a person who is examining his inflamed joints. As regards the paralytic form, the most common error arises usually owing to the presence of foreign bodies in the throat. I have seen this mistake made several times. Again, the temporo-maxillary articulation in the dog is liable to a variety of diseases, inflammatory and degenerative, and thus a spurious palsy of the jaw may be produced. The most important point undoubtedly as regards the clinical diagnosis is that *all suspected animals should be isolated.* I suppose it is not of very much use preaching on that score, as the advice is not likely to be followed, because always in this country if rabies is suspected in a dog it is promptly killed, and often it may afterwards be quite impossible to say whether the animal had or had not rabies. Isolation for a few days will settle the point in one way or the other, and it is not difficult in most places where dogs are kept to isolate the animal in such a way as not to cause any risk to others. But, particularly if anybody has been bitten by the animal, it is a great mistake to at once kill the dog, because great delay is then caused in the diagnosis.

Next as regards the post-mortem diagnosis. The most important point in this is the presence of foreign bodies in the stomach and the absence of food, with a peculiar dryness of the mouth and throat ; besides which the presence of sugar in the urine has a certain value. Very often there is sufficient urine in the bladder to make that examination after death. As regards the stomach, one has to be very cautious in expressing an opinion simply owing to the contents. Unless you find a *variety* in the contents, such as one sees in rabies, you must be very chary in expressing an opinion. The most important point in post-mortem examinations is undoubtedly that no one *can exclude* rabies on a post-mortem examination. A striking instance illustrating this important fact has recently occurred in a coroner's court. A man

died of hydrophobia, and two veterinary surgeons were exceedingly confident that the animal had not got rabies, partly because the contents of the stomach were normal. You cannot exclude rabies by a post-mortem examination since all dogs suspected are usually killed, and the characteristic post-mortem lesions are not developed until the malady has been allowed to run its whole course. Therefore one would say that the most important thing in regard to the clinical diagnosis of this disease is to isolate the animal and watch it, for by a post-mortem examination the malady can practically *never* be excluded.

As regards the experimental diagnosis, first of all there is the great drawback that a considerable lapse of time is required in order to make the diagnosis by this means. If you inoculate a rabbit it takes at least fourteen to nineteen days for the symptoms to develop, and it may take longer ; and if a person has been bitten by a rabid dog, the time lost in waiting for the result of the experimental inoculation is so long that it may endanger the patient's life. Therefore, although the experimental diagnosis is of great value from a scientific point of view, it has this very serious drawback. That constitutes another reason why suspected animals should be isolated and watched, since by this means the diagnosis may be made in three or four days. I have only time to go into the experimental diagnosis shortly. The experimental diagnosis may be impossible owing to the presence of some septicæmic virus in the brain of the suspected animal. If the brain contains some organisms causing septicæmia, of course the rabbits all die of septicæmia in one to three days, and hence the question cannot be settled. The other is the presence of putrefaction, and I have had at least one very serious failure owing to putrefaction where I certified that the animal had not got rabies, while in all probability it had, but where the putrid state of the nervous system interfered with the test. That is in contradistinction to the French observers who have been able to obtain successful results with the test when there has been advanced putrefaction ; so have I, but in this one instance the test failed owing to putrefaction. There is one other point in connection with putrefaction. You may inject putrid brain underneath the dura mater, —indeed, it may be so far advanced as to be green and liquid, without producing any ill effects what-

ever ; in that respect it is similar to the injection of foul-smelling pus into the peritoneum. It used to be laid down that if the material to be inoculated is putrid, it ought to be introduced into the anterior chamber of the eye ; but I have found that quite unnecessary, and I have never had a death from injecting putrid brain underneath the dura mater, although, of course, I have had many deaths from the injection of septicæmic brain. The organisms of putrefaction do not lead to any serious inflammation in the meninges.

Lastly comes the question of diagnosis of the disease in the rabbit inoculated. The diagnosis of rabies in the rabbit I have considered sufficiently ; the main point is the occurrence of the paralysis with the clonic spasms, when the general health of the animal has not been greatly impaired.

In conclusion I will just adduce some statistics, comparing the opinion of the veterinary surgeons with regard to the suspected dog with the results of the inoculation. In the course of last year seventy-one cases have been investigated at the Brown Institution, and at the present time sixty-five of these are complete,—that is to say, six are still under observation. Of these sixty-five cases the veterinary surgeon has given an opinion on forty-nine ; that is, in forty-nine cases out of sixty-five which have been examined completely the veterinary surgeon suspected rabies ; in the other sixteen cases he did not give any opinion at all, or else he thought the case was not one of rabies. Of the forty-nine cases which the veterinary surgeons suspected were rabies, five were pronounced or suspected to be dumb rabies, leaving forty-four of suspected furious rabies. The inoculation results of these sixty-five completed cases are as follows :—of the sixty-five, forty-two of them turned out not to be rabies at all, and twenty-three were shown to be rabies. I am not adducing these statistics as any criticism of the veterinary surgeon, because there is no doubt considerable difficulty in the diagnosis, but simply to compare results ; but it shows that, tested by inoculation, less than one half of the cases of suspected rabies turned out to be cases of rabies. One other reassuring fact is that during the last year, in contradistinction to the year before, the amount of rabies in London, or the amount which has fallen under my observation, is very limited.

I have only had seven suspected cases from London, and only three of these turned out to be cases of rabies, the other four not being cases of the malady. I have had fifty-eight cases from the country, twenty of which proved to be cases of rabies, and thirty-eight were not cases of that disease. These statistics are not very extensive, but they show very clearly that until all the cases are examined by inoculation one cannot place much reliance upon the official records, and it is unfortunate in that respect that at the Brown Institution we do not get all the cases of rabies as we used to; we only get those cases in which a human being has been bitten, and that fact limits the number very greatly.

ON SOME POINTS IN THE TREATMENT OF SYPHILIS AND GLEET.

At the West London Hospital, Hammersmith.

By F. SWINFORD EDWARDS, F.R.C.S.,

Surgeon to the Hospital, and to the St. Peter's Hospital for Stone and Urinary Disease.

GENTLEMEN,—I purpose to take for my subject to-day, venereal disease, and to touch on various points that have occurred to me in private practice in the treatment of syphilis and of chronic urethritis or gleet.

With regard to syphilis, I will commence by laying down this rule, viz. the desirability of withholding all specific treatment until the diagnosis is certain. I look upon this as a very important point. In my student days we were taught that every medical man should at once be able to give a definite opinion as to the nature of a given sore; and if he failed in this, it was due to ignorance in differential diagnosis.

Now, by the light of experience I may say emphatically that there is no need to be in a hurry as to expressing a definite opinion. The great point is to avoid giving mercury until you are sure that the patient is suffering from syphilis. This is worthy of your attention, especially having regard to lesions that may develop in after life. If a patient presents himself to you with a sore of uncertain nature, you may think that because it is indurated, and because he has some indurated

glands in the groin, it is syphilis. You yourself are not absolutely certain, nevertheless you say you will be on the safe side and begin a mercurial course. Nothing can be more harmful! The symptoms perhaps clear up; but still, having committed yourself to a diagnosis of syphilis, you feel obliged to give him his full course, thus condemning one to whom it is worse than useless to a two years' mercurial course. He goes forth to the world hall-marked, and you know him as a syphilitic subject. In after life the man, thinking he has had syphilis, because you have treated him for such, develops an ugly-looking sore on the tongue, and it is a question as between syphilis and epithelioma. You ask him whether he has ever had syphilis, and he replies in the affirmative. That probably makes you jump to the conclusion that the ulcer is syphilitic, and you put him upon iodide of potash, or perhaps some mercurial preparation. After losing much valuable time you find out that it is epithelioma after all, a fact which would have been apparent much sooner had there been no suspicion of syphilis through the original faulty diagnosis. On the other hand, you may say, " If we do not give mercury as soon as we think that the sore is probably syphilitic, we are doing our patient harm; we are allowing the disease to make headway." But it is not so, for you will find that the administration of mercury, even when constitutional symptoms have appeared, is just as efficacious as when given in the primary stage. By constitutional symptoms I mean the syphilitic roseola which usually appears on the abdomen, accompanied or not by the specific sore throat. There is no doubt that one often does give mercury before the roseola appears, but then one is absolutely certain that the man has contracted syphilis. If a man comes with a sore on the prepuce or glans penis, which is both markedly and characteristically indurated, with possibly no abrasion of surface, or with a shallow depression not sharply punched out, with a healthy reddish-looking surface, not that yellowish surface characteristic of a chancroid; if he has also—and this is more important than all—enlarged and hard glands in the groin which show no sign of matting or running together, you may put that down with absolute certainty as syphilis, especially if the history bears this out. Under these circumstances the sooner you commence to give mercury the better.

I will next touch upon the different methods of treatment. As to giving mercury by the mouth, you are well aware of the preparations usually employed. A favourite pill amongst specialists now-a-days is 3 grains of the ordinary pil. hydrarg., with ¼ grain opium to counteract its aperient effects, or the hyd. cum creta 2 grains, given two or three times a day. A pill which has made some little repute for itself is the tannate of mercury, of which 1½ grains can be given thrice daily. When I was a student at St. Bartholomew's, the green iodide of mercury was a very efficacious and favourite form, though one does not see it prescribed much now-a-days, possibly because it is not a very stable compound. A point I want to insist upon in regard to the diagnosis of syphilis is that if you once begin to give mercury it is no good stopping it before the allotted time; that is to say, if you have made up your mind that the patient has an infecting sore you must go through with your treatment for the two years which is recognised as the proper time. It is now laid down that slight doses of mercury given for long periods is the best method of treating syphilis.

Another method, and one which is employed very much now, is the inunction of mercury, as it is carried out in Aix-la-Chapelle. There the patient is rubbed with a certain dosage of mercury or ung. hyd. daily, after having had a hot sulphur bath. Whether the sulphur is necessary I am not prepared to say; I know we can treat patients over here quite as well if they will only follow our advice as they do that of the medical man abroad. The way I employ it is to use the ordinary blue ointment, and tell the patient to put on a piece of the size of a ten-grain pill on the sole of the foot, rubbing it in after a warm ·bath ·for a minute or two, and then drawing on undyed socks, thus walking the mercury in. This is a very good method of using the drug, and may be combined with one of the others.

The method of intra-muscular injection is one about which a good deal has been written in recent years, and there can be no doubt about its benefit. It has this to recommend it, that the surgeon can absolutely control the dosage and the times of its administration. The method is also cleanly, which cannot be said of the inunction method. One uses either sal alembroth or sozo-iodol of mercury, the latter being the preparation I usually employ. This is the formula: 5 grains sozo-iodol, 10 grains of iodide of sodium, to 200 minims of distilled water. Ten or fifteen drops of this should be injected into the muscle—usually the gluteus maximus—once or twice a week, according to the effect it has upon the patient. Of the sal alembroth or perchloride of mercury take 32 grains, of chloride of ammonium 16 grains, distilled water 2 ounces; 10 minims is used for the injection.* In injecting this it is well to use a syringe with a long needle, for you may have to get through a great deal of fat, and you must be sure to get the injection into the muscle; if you merely insert the fluid into the subcutaneous tissues you may give rise to abscess. You must, of course, see that your syringe is sterile, and it should· be armed with a rubber plunger and platino-iridium needle, which latter does not rust. There is one made by Hawksley which suits the requirement exactly. The injection should be made into the fleshy part of the gluteus maximus. Very little pain is complained of, the patient simply feeling for some hours as if he had had a blow there.

With regard to the fumigation treatment, I have had but very little experience of it. It is somewhat cumbersome, and is now but seldom used. Your patient may be undergoing the regular course of mercury, and may develop, as a secondary symptom, some affection of the pharynx, tonsils, or tongue; in fact, this is one of the most common manifestations. It may prove very troublesome, and is perhaps a symptom which bothers both the patient and surgeon more than anything else. Some months after inoculation the tongue may become cracked and fissured, with mucous patches and ulceration of the tonsils and pharynx. It is the tongue which mostly troubles the patient, as it interferes with his eating, drinking, and smoking. Under these circumstances you must interdict all smoking, and you will probably have to stop mercurial treatment for a time. I would lay stress upon this latter point; when a man suffers from any secondary ulceration of the mouth, it is, as a rule, well to stop for a time all mercurial treatment. Why, I cannot say, unless it be that the ulceration of the mouth may be as much due to the treatment as to the disease.

There is another drug which is very useful in syphilis, and that is iodide of sodium. This seems

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* *Vide* A. Cooper's work on ' Syphilis.'

to have in certain cases a more beneficial effect than iodide of potassium. I recollect two or three cases of nodes on the forehead, which had resisted all treatment and were beginning to suppurate, which rapidly healed under the administration of sodii iodid. The last case was that of a gentlemen who had two large lumps on the forehead, each the size of a pigeon's egg, which were very disfiguring and threatened soon to suppurate. I thought every day I should have to open them. He was then on iodide of potassium and a little liq. hyd. perchloridi. When he came under me I changed this treatment, and put him on to 10 grains of the iodide of sodium, and 5 grains of carbonate of lithium, three times a day, as I had found the same combination act like a charm in a gentlemen fifteen years ago, who was suffering from a like lesion. Within a fortnight these lumps had nearly disappeared, and there was not a sign of them at the end of a month. Therefore I think that iodide of sodium when combined with carbonate of lithium has a greater effect upon syphilitic gummata and nodes than its sister iodide of potassium.

Speaking of iodide of potash, which is a disagreeable salt to take, and often gives rise to indigestion, and a good deal of inconvenience and discomfort in the way of coryza and a general pustular eruption, I would like to draw your attention to an excellent substitute, namely, hydriodic acid, of which Gardner's syrup of hydriodic acid is to be recommended. One ounce of this syrup contains six grains of iodide, and the dosage is one drachm of the syrup. It is very pleasant to take, and does not upset the digestion. Its benefit is very marked in cases in which the iodides are indicated. I have not given it an extensive trial because it has only lately come under my notice, but I have so far found nothing but great benefit from its use. In one case, that of a man who came to me with specific orchitis and asked if it was necessary to have it removed, for castration had been advised, this drug proved of great value. There was no doubt about the diagnosis, and I put him on iodide of potassium, and gave him a mercurial ointment to rub in. About a fortnight afterwards the condition was somewhat improved, but he was "out of sorts," and had a nasty taste in his mouth which pre-·ted him relishing his food, and he was troubled

with indigestion. I then tried him with Gardner's syrup of hydriodic acid; with this result, that whilst the testicle continued to diminish in size, he promptly lost the unpleasant symptoms to which the pot. iod. had given rise.

Some cases of syphilis, as you know, are most intractable, and resist everything we employ. A very good remedy in the latter stages of syphilis is Donovan's solution; this is especially beneficial in long-standing palmar psoriasis, as well as in manifestations about the mouth and tongue. Still there are, as I have remarked, certain cases, such as ulceration and necrosis about the palate and nose, &c., which seem to yield to nothing. For these we have a remedy to fall back upon which is extremely serviceable; in fact, so much so that I may say I have never seen it fail. I refer to Zittmann's treatment. It is not much known, and still less is it employed; I have, however, had at least a dozen patients who have undergone this particular form of treatment. The course lasts a fortnight, and consists in keeping the patient in bed in a hot room up to a temperature of at least 80° Fahr. For the details of this treatment I cannot do better than quote from the able book on syphilis by my friend Mr. Alfred Cooper. The decoctions and pills are made from the following formulæ.

Zittmann's decoction, No. 1, the strong decoction.

Sarsaparilla root...	...	...	ʒiv.
Aniseed fruit	...	...	�
Fennel fruit	...	...	Ꝫij, Əj.
Senna leaves	...	...	ʒj.
Liquorice root ...	...	...	Ꝫiv.

And in a linen bag white sugar and sulphate of alum, of each 2 drachms, subchloride of mercury 1 drachm 1 scruple, red bisulphide of mercury 1 scruple. Add to this 3 gallons of water, boil gently down to 1 gallon; strain, and put into four 40-ounce bottles.

Zittmann's decoction, No. 2, the weak decoction. To the dregs of No. 1 decoction add sarsaparilla root 2 ounces, lemon-peel cardamoms, and liquorice root of each 1 drachm to 3 gallons of water boiled down to 1 gallon; strain, and put into four 40-ounce bottles. The pills—

℞ Hyd. subchlor.... ... ... gr. ij.
  Ext. col. co. ... ... gr. v.
  Ext. hyos. ... ... gr. ij.
    M. Ft. Pil. ij.

Diet consists of :—*Breakfast*—boiled egg or bacon, tea (no sugar) ; butcher's meat for *lunch*, with vegetables, but no fruit ; *dinner*—soup, fish, and poultry.

On the evening before beginning treatment two pills are taken, and for the next four days, at nine, ten, eleven, and twelve o'clock in the morning, half a pint of strong decoction is taken *very hot ;* at three, four, five, six p.m., half a pint of the weak decoction is drunk *cold.* The patient should keep in bed except for one hour every evening. On the fifth day he may get up and may have a hot bath, and if he likes a little brandy, or whisky and soda. In the evening two pills are administered, the patient starting the decoctions the next day as before. After fifteen days the treatment is discontinued. There are thus three series of four days each with one day interval between each. It is a most admirable method of treatment. I was at my wits' ends how to cure a young fellow who had been ordered to join his regiment abroad. He had an attack of secondary syphilis, viz. ulceration of the pharynx and of the soft palate, and although after a time all mercury was stopped, and his throat was carefully painted with nitrate of silver twenty grains to the ounce, and subsequently sulphate of copper four grains to the ounce, he did not improve beyond a certain point. After a course of Zittmann he went out apparently quite well after a fortnight. He is now continuing his mercurial treatment in the form of pills while abroad.

With regard to local syphilis, pseudo-syphilis or chancroidal ulceration, I have only to say one thing. You know it is sometimes very difficult to arrest the ulceration, and that occasionally the process extends so deeply as to involve important structures. For instance, phagedænic ulceration in the groin may eat into the femoral artery and cause serious results, if not death; and chancroidal ulceration may entirely destroy the glans penis. It is usual to attempt to arrest this process by the application of strong caustics, such as the acid nitrate of mercury, or fuming nitric acid, or even the actual cautery. But I can tell you of a very much better form of treatment, and far simpler, namely continuous immersion in hot water ; whether it be for phagedænic ulcer of the groin or for the same disease in the penis, there is nothing like it. The patient sits in a hot bath in his room (it is well

to put in a circular india-rubber cushion for him to sit upon) with a blanket over the top of the bath, through which a hole has been made to admit his head, and he stays there four hours at a stretch, an attendant being there to draw off the water as it cools, and to add a further supply of hot. The bath need not have any medication, though there is no objection to adding a little hyd. bichloride or permanganate of potash. Cases which have had a severe cauterising treatment in vain, heal up very kindly indeed under the treatment I have just mentioned.

As to the treatment of chronic urethritis, I purposed to have given you a demonstration on patients suffering with this complaint, in order that you might see how to set about diagnosing the site of a gleet, and ascertaining what is keeping it up. I have been disappointed in getting such subjects to attend to-day, but I have the permission of this patient, on whom I have recently operated for subdiaphragmatic abscess, to make use of him for the purpose of a urethroscopic demonstration. We will imagine that this is a patient who comes into your consulting room or in the out-patient department of a hospital, and says, "I have got a discharge." You look at it first of all, and you may see a profuse purulent discharge, or you may see nothing at all. But if the patient says he has a discharge you may generally take it that he has. A gleet is a muco-purulent or mucoid discharge, usually the outcome of an antecedent gonorrhœa, though it may be due to some irritating constituents of the urine, such as those which exist in a gouty subject, for there is no question that a gouty patient may develop a discharge from the urethra which is indistinguishable from gleet following gonorrhœa. The habit of riding bicycles has given rise to many of these cases, called bicycle gleet. They do not last very long, clearing up much more quickly than those due to gonorrhœa. You may have before you a case of gleet which you take to be venereal, and you order an injection, and put him on capsules of sandal-wood oil, and trust he will get better. But he does not. He calls time after time for treatment until you inquire further into his habits, and find that he comes of a gouty family, or gets some manifestations of gout as eczema or pruritus ani, or those peculiarly uncomfortable darting pains in the plantar fascia. You then put him on an anti-gout regimen with Vichy

or Contrexeville water, and he promptly gets well. There is, therefore, such a thing as gleet due to gout.

Let us now suppose that the man's discharge has lasted a year or more. You ask him if he can pass his water; the patient perhaps replies in the affirmative. I take a syringe such as I show you here, and wash out the front of the urethra with water. The injection will not penetrate further than about six inches; the compressor urethræ muscle sees to this. You do this once or twice and catch the washings in a glass. Then you ask the patient to pass his water, and he does so into another glass; thus we have the washing out of the front urethra in one glass, and the urine in the other. If the débris is contained in the first glass, we know that the stress of the inflammation is in the anterior urethra; that is, the part in front of the compressor urethræ muscle. If, on the other hand, the shreds are in the urine, we know the inflammation is in the membranous or prostatic urethra. If the latter be the case, anterior injections are of absolutely no value. Thus we have arrived at a very important stage in the diagnosis. We will imagine that all the shreds and débris have come away in the washing out of the anterior urethra, and that the urine is perfectly clear. We must now examine his front urethra more carefully, especially with a view to stricture. It is very common to have contraction of the meatus, and a congenital stenosis which amounts to stricture will keep up a gleet just as much as an ordinary stricture in any other part of the canal. With this object an exploring bougie should now be passed. I show you Otis's pattern; they are excellent instruments. They may be made in metal or in gum-elastic. You take the largest bulb which you think will pass the meatus, and having oiled it, endeavour to pass it in. If unsuccessful, take an instrument which is somewhat smaller, which we will presume passes, but catches in the orifice on withdrawal; this demonstrates a meatal stricture, contracted or small orifice. It is a very simple matter to divide this, and in many cases is essential if a gleet is to be cured. Otis's dilating urethrotome is very convenient for the division of all penile strictures, including those of the meatus.

Let us next imagine you find no stricture, as in the case before us; that the orifice admits a No. 28 instrument (French). You know that he has got

something wrong with the anterior urethra, and that it is not due to stricture. Next you pass the tube of a urethroscope, first of all in nervous or sensitive subjects injecting a little eucaine to obviate any slight pain. I have used cocaine extensively for this purpose, but am giving it up on account of its toxic effects. I have had cocaine poisoning in a patient on whom I only used a 5 per cent. solution in the urethra. Of course you may employ it for years without having such a case, but they do occur every now and then, and if you once get a bad case you are not likely to want to repeat the experience. In a case of proctotomy for stricture of the rectum I injected ℥ij of a 5 per cent. solution into the rectum, retaining it for one minute, then passed the speculum and dilated the anus, and the injection ran out. This was done that I might dress the part painlessly; but before I left the room, that is from five to ten minutes after the procedure I have mentioned, symptoms of cocaine poisoning came on, and kept me busily occupied with the patient for over two hours. I will now pass a No. 26 tube, apply the urethroscope, and ask you to view the urethra. The tube having been passed to its full extent, a probe holding a piece of cotton wool is passed down to remove any fluid, be it oil, urine, pus, or blood, which would otherwise obscure the view. The most common thing to find is a congested area, situated generally in the bulbous urethra; or you may find a granular patch or some warty growths. You may see some mucous glands standing out, yellowish in colour, looking as though ready to burst, which indeed they do from time to time. In addition you may, as the tube is being withdrawn, come across signs of stricture, such as a want of pliability in the infolding urethral wall, the part appearing much whiter than normal. Now and then one sees an orifice out of which a drop of pus wells up. I remember some years ago the case of a young cricketer who had tried practically everything. I could not find anything in the way of a stricture, but on examining his urethra by the electric light I saw a drop of pus well up into the mouth of the tube, and after mopping this up I found the mouth of one of the small glands just mentioned, whence the drop of pus had evidently escaped. I therefore got a fine probe, one extremity bent to a right angle, coated it with lunar caustic, and applied it

to the spot. I had no need to do it again, as the case was cured, though the gleet had lasted for more than a year. Sometimes it is necessary to apply solutions of argent. nit. in varying strengths to several points, and probably more than one application has to be made, but the plan of treatment is usually very efficacious.

(I might point out to you, gentlemen, in passing, that in this case the electric light has exposed what was unknown to our patient, viz. the presence of a gleet, due no doubt to several patches or congested areas, which you can see situated in the bulbous urethra.)

Having examined the anterior urethra, we will suppose that we can find nothing to account for his gleet, but we know that a gleet is present from the shreds in the urine. There are those who say that through particular tubes they can see the deep urethra equally well with the penile, but I confess I have not brought myself to that state of perfection. The same lesions which give rise to a chronic anterior urethritis, will do so in the posterior part of the canal. For treatment we have three different methods; one by instillation of nitrate of silver into the deep urethra, either by a Guyon's syringe, which I have here, and which enables you to apply the injection to the prostatic urethra without any difficulty whatever, or by Dick's catheter, which also goes by the name of Erichsen's. It is an ordinary silver catheter, but instead of the usual eye it has a number of small perforations extending from the tip to the curve, i. e. for about two inches. A long piece of sponge is enclosed in a spiral spring, to which is attached a stylet, and by which means the solution is expressed. Solutions of argent. nit. in strength varying from five to twenty grains to the ounce are employed, and in some cases it may be necessary to use the solid caustic by means of the "porte caustique." A second method is by the passage of large-sized metal bougies, and here let me recommend this pattern, which, although old, has many important qualities. First of all they are fairly heavy, being made of pewter; secondly, they are bellied at the angle, and are olive-shaped at the point; there is great dilating power; and by reason of the shaft diminishing in size as the handle is approached, it is not held by any slight anterior contraction, and so the work, progress and whereabouts of the tip and belly are not masked. For instance, in this case I can just

pass a No. 28 through the meatus, and afterwards move it freely in the deep urethra; but I should not have been able so to do if the shaft had been equal in circumference to the belly. You may rely only on the passage of bougies lubricated with carbolic oil or vaseline, though I find that when they are smeared with some tenacious ointment, as, for instance, two drachms of iodoform to an ounce of ung. resinæ, it is more beneficial. This you cannot pass straight into the urethra without dipping the coated bougie into some other lubricant, such as carbolic oil. Leave it in for five minutes at first, and then gradually increase the time up to half an hour.

Another plan is by irrigation. A glass receptacle holding a pint or more is filled with a hot solution of pot. permang. 1 in 2000. A rubber tube with a glass nozzle is attached. The patient after emptying his bladder lies down, and the receptacle is hung up some five feet above him. Insert the nozzle into the meatus, and gradually let the stream run in; after a time it will force its way past the compressor urethræ and fill the bladder. The patient then gets up and evacuates the bladder contents as in normal micturition, thoroughly flushing the urethra. This manœuvre may be repeated daily, and the strength of the solution gradually increased until all signs of gleet have disappeared. It is an excellent method, but requires some practice both on the part of the surgeon and of the patient.

A Case of Purpura attributed to Benzene Poisoning.

—M. Le Noir and M. Claude relate the case of a man with rare hæmorrhagic spots on his body, but especially nasal and gingival hæmorrhages, and a hæmorrhagic pleurisy. He died suddenly in a condition of extreme anæmia. At the autopsy a pleural hæmorrhage was found; there were also myocardiac and endocardiac infarcts, ecchymoses in great abundance on the mucous membrane of the stomach and intestine, and finally, two hæmorrhagic centres in the left optic layer and in the pons Varolii. The onset of the symptoms had been characterised by large subcutaneous ecchymotic patches.

Inquiry elicited the fact that the patient had, for a long time, been exposed for days at a time to benzene vapours.—*Gazette hebdom. de Médecine et de Chir.*, Nov. 4th, 1897.

SOME DETAILS IN THE
TREATMENT OF PHTHISIS.*

BY

F. GRAHAM CROOKSHANK, M.D.Lond.,

Late House Physician to the Brompton Hospital for
Consumption.

MR. CHAIRMAN AND GENTLEMEN,—There is little
novelty, but much truth, in the remark that the
average student is better acquainted with the
curiosities of medicine than with those diseases
by the treatment of which he will have to earn
his daily bread. One subject in particular he
cares little for,—the treatment of chronic pul-
monary tuberculosis, the commonest of all fatal
diseases in these islands. It is not the fault of
the student that this should be the case; it is
partly the fault of circumstance, and partly the fault
of the existence of comparatively inaccessible
special hospitals.

May I plead the experience of a House Physician
in the Brompton Hospital as my excuse for ven-
turing on the subject.

I propose on this occasion not to discuss the
treatment of phthisis by climate or any of the
rival "cures," but to very briefly indicate what
should be done for a phthisical patient who has to
be treated in hospital, or at his own home. And
there is ample justification for the hope that, even
under these unpromising conditions, perfect cure
may be occasionally obtained.

A case in point is that of a young woman who
in the year 1864 was admitted to the Brompton
Chest Hospital for hæmoptysis. Dr. Hamilton
Row, under whose care she was placed, detected
lack of resonance and the presence of humid
crackles beneath both clavicles. Dr. Row made
a diagnosis of phthisis, and prescribed a rather
active course of treatment, which was pursued for
several months. The woman was then discharged,
having gained in weight and improved in every
respect. For thirty-three years this woman fol-
lowed her occupation as a seamstress, living for
nearly the whole of the time in London, in the
enjoyment of fairly good health.

In January, 1897, she was admitted a second
time to the Brompton Hospital, on this occasion

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with mitral disease and cardiac dropsy, to which
she soon succumbed. When the lungs were
examined at the post-mortem, one solitary calcified
tubercle was found at the right apex. At the left
apex there was found a densely fibrous scar sur-
rounding one large calcified tubercle, and a little
distance away, two pigmented and calcified sub
pleural nodules.

Such a case is probably unique in the com-
pleteness of its record, but is happily far from
being so in the good fortune of its issue. The
existence of such a record should always be borne
in mind when a case of early phthisis presents
itself for treatment.

It is scarcely necessary to urge on you that, if
we wish to carry our cases to an equally fortunate
issue, we must insist in the first place on the strict
observance of the ordinary rules of hygiene,—
personal cleanliness, moderate exercise, flannel
underwear, and free ventilation.

But it also should be made clear to the patient
that the less daytime he spends in bed, and the
more he spends in the open air, or at least the
sunlight, so much the better for him.

It is necessary to recognise very clearly the limi-
tations of our power in regard to phthisis. We
are absolutely destitute of any means by which
we can directly destroy the tubercle bacillus in the
lung, without injury to the host.

But what we can do, and therefore what we
must attempt to do, is, by the promotion of nu-
trition, to increase the host's defensive power;
and success in the attainment of this object, as of
any other, is best secured by attention to detail.
A cough suitably relieved is ensued by a good
night's rest; refreshing sleep secures a matutinal
appetite; and the successful absorption of a
piece of fat bacon means an appreciable gain in
nutrition.

At the Brompton Hospital, every patient that
can be is weighed once a fortnight, and it is in-
teresting to note how often the alleviation of a
relatively trivial symptom is followed by a gain in
body weight.

The first of all measures that promote nutrition
is, of course, the provision of suitable food.
But although in certain cases restrictions have
to be enforced, in phthisis, as a general rule, that
food is best which the patient likes best and takes
best.

Certain food-stuffs, however, the fats and carbo-hydrates, possess a special value. And this is so, partly because of the increased oxidation involved by the fever, and partly because of the direct loss represented by the products of caseation.

Dr. Burdon Sanderson has recently very clearly pointed out the reasons why sugar, and by infer-ence converted starch, are of such value in pre-venting tissue waste during continued fever.

At Brompton every patient who can, takes fat bacon at breakfast, and the sisters can give a very fair prognosis of many a case by noting " how he takes his bacon." Milk, cream, butter, sugar, and potatoes should, of course, be chief items in the dietary.

Few cases of phthisis can do without alcohol as a drug, and most select it as an article of diet. The particular form in which it is given is best left to the patient's choice. But whatever the diet, most cases of phthisis have, at one stage or another, to be treated for dyspepsia. And ob-viously the possibilities of nutrition depend on the success with which this is done.

In the early stages of phthisis the dyspepsia is simple, and either catarrhal in nature or the type named by Dr. Martin " gastric insufficiency."

It is of less importance to differentiate these types therapeutically than clinically ; and no pre-scription suits either so well as the old and favourite one of Sir R. Quain :

Sod. bicarb.	...	...	... gr. xv.
Ac. hydrocy. dil.		...	... ♏iv.
Inf. gent. arom.		...	... ℨj.

This should be taken twice a day before food, and its use may well be continued for weeks or months.

Should pain still occur, 10 minims of tr. nucis vom. may be added to each dose ; or, if flatulence be annoying, 5 gr. of ammon. carb. substituted for the acid and soda. 3 minims of liq. potassæ is a good alternative to the soda, and the follow-ing mixture, with or without 15 minims of dilute nitro-hydrochloric acid, excellent in the more atonic cases :

Tr. lupuli	...	...	... ♏xx.
Inf. cascarill.	...	...	... ℨj.

These forms of dyspepsia and their treatment are of course simple, but, as the disease advances and the alimentary canal shares in the general atrophy, qualitative deficiencies in the gastric and pancreatic juices have to be made good.

Hydrochloric acid must be given before food, and pepsin supplied in some form or another. Benger's liquor pepticus given after food is effi-cient, but patients much prefer a drachm of vinum pepsinæ taken with an ounce of aromatic infusion of gentian before food. Since, however, it is on his carbohydrate rather than his proteid meta-bolism that your patient's well-being depends, it is better to prescribe some preparation, such as lacto-pepsin, containing diastase as well as pepsin. It is for the same reason that taka-diastase, malt, maltine, and bynol are prescribed, and that, if pre-digested foods have to be given, the pancreatised preparations such as Benger's are the best. Liquor pancreaticus is, of course, perfectly useless when given by mouth, as it is quite inactive in the naturally or artificially acid media of the stomach.

A common but very troublesome occurrence in phthisis is vomiting induced by cough after meals. Nothing relieves this so well as the pre-scription of—

Liq. strychninæ	...	...	♏v.
Bism. subnit.	...	...	... gr. xx.
Mucil. trag.	...	...	... ℨss.
Aq. ad	...	...	... ℨj.

To be taken four times a day.

Other varieties of dyspepsia met with are those complicated by diarrhœa: If the diarrhœa be, as is often the case, merely lienteric, treatment is simple ; but if pain and tenderness in the right iliac fossa be present, and ulceration of the bowel probable, relief is not so easily given. Rest, and usually complete rest, should be enforced, al-though it must always be borne in mind that, if tubercular diarrhœa be suddenly checked and the patient confined to bed, the pulmonary disease will make rapid progress. If the pain and tender-ness be marked, the right iliac fossa had better be freely painted with liq. iodi. until the skin be broken.

A comfortable pad of gamgee tissue should be worn on the abdomen so as to keep up gentle pressure. The use of cod-liver oil, cinchona, or malt should be stopped at once, and the diet modified, so that milk (plain or flavoured with rum), koumiss, arrowroot, cornflour, and Benger's or Mellin's food may form the staple. Solid food,

except for a little pounded fish or chicken, is better withheld.

Bismuth is undoubtedly the best drug to give, and its most suitable salts the subnitrate, salicylate, or subgallate, prescribed thus :

Bismuth. salicyl.	... ...	gr. xx.
Tr. camph. co. ...	... ...	♏xx.
Mucil. tragac. ...	... ...	ℨss.
Aq. camph. ad ...	... ...	ℨj.

To be taken every four hours if necessary.

If this do not check the diarrhœa, 15 minims of tr. coto. should be added to each dose, or half a grain of cotoin given several times a day in pill. These measures failing, it becomes necessary to give opium in some combination or other; the most potent being that recommended by Dr. Fowler :

Cupri sulph.	... ...	gr. ¼.
Pulv. opii	... ...	gr. ½.
Ext. gent.	... ...	gr. ij.

Make a pill : give one two or three times a day.

This pill certainly checks the diarrhœa very rapidly, but has a tendency to fur the tongue and set up nausea. It is of most use when given occasionally during the continued administration of bismuth.

The relief of constipation is, of course, as important in phthisis as in any other condition. Mercurials and all cathartics are unsuitable; and the best preparations are the German liquorice powder, the confections of senna and sulphur, mild aloes and belladonna pills, and the combinations of cascara sagrada. Of the last, Martindale's tinctura laxativa is by far the best. It should be given in small doses (15 to 30 minims) twice or thrice a day after meals ; and not in one large dose at bedtime. If this plan be followed, the dose can be gradually reduced, and the constipation cured and not merely relieved. Formula :

Tr. nucis vom.
Sp. ammon. aromat.
Tr. bellad.
Sp. chlorof.
Ext. casc. sag. liq.   Of each equal parts.

15 to 30 drops in water thrice daily after meals.

It is of the greatest importance to carefully examine the teeth in all cases of phthisis, real or suspected. Many cases of indigestion depending on carious teeth have been diagnosed as early phthisis, the suppuration having been free enough

to set up mild symptoms of septic absorption, and the mimicry completed by lienteric diarrhœa due to the imperfectly masticated food. But in all cases of undoubted phthisis no effort should be spared to have carious stumps extracted, the gums cleansed, and artificial teeth supplied. It is worth noting how few phthisical patients are the possessors of good teeth. As soon as the digestive system has been brought into good order we have to make a choice between certain drugs, valuable both for their general action and their special effect on certain symptoms. The first and best of these is, of course, cod-liver oil. In some cases it cannot be taken ; it should be tried in all. It is best given in drachm doses, twice a day, ten minutes after food, and it is best taken from a tumbler between two strata of fresh lemon juice. The dose may be increased if the oil is well borne, though little advantage is to be gained by heroic dosage, any quantity much above an ounce daily being passed unabsorbed. And no amount of cod-liver oil that can be absorbed will compensate for a destroyed appetite and nauseated stomach.

The exhibition of mist. gent. alk. may be continued with advantage while cod-liver oil is given ; and should the lemon juice be not acceptable to the patient, the following may be tried :

Ether	... ...	ℨij.
Cod-liver oil	... ...	ℨv.

Dose ℨij.

A third and very excellent method is to give the oil in small doses combined with one of certain acid mixtures. The whole then forms what Dr. Williams has called an oil sauce.

One of the best of these mixtures is made up thus :

Ac. nitrici dil.	... ...	♏xv.
Dec. cinchona	... ...	ℨj.

It sometimes sets up diarrhœa, however, and if so one may try—

Liq. strych.	... ...	♏v.
Ac. phosph. dil. ...	... ...	♏xv.
Inf. quassiæ	... ...	ℨj.

A third formula is—

Ac. sulph. dil.	... ...	♏xij.
Tr. aurant.	... ...	ℨss.
Salicin ...	... ...	gr. iij.
Syr. zingib.	... ...	ℨss.
Inf. aurant.	... ...	℥ss.

Many more will be found in Dr. Williams book.

These mixtures are excellent in themselves, and form very palatable combinations with the oil. They should be dispensed separately from the oil, and the "oil sauce" only mixed at the time of taking.

Half a drachm of cod-liver oil, 5 minims of compound tincture of gentian, and 25 minims of lime water makes an excellent emulsion for the use of children. Every effort should be made to induce the patient to take cod-liver oil, but it sometimes is obstinately rejected. In that case it is better to fall back on the general tonics than to employ any of the so-called substitutes for cod-liver oil; they are all unsatisfactory. Malt has some diastatic value, but often sets up diarrhœa, and the latest suggestion—petroleum—has nothing but novelty to recommend it. As a general tonic few mixtures have a higher value than that of nitric acid and cinchona, just mentioned. It is particularly suitable to chronic cases with good digestive powers. Arsenic is of the highest value, especially in cases marked by anæmia and tremor. It frequently controls night-sweats, and it is an old clinical observation that if a patient be tired in the forenoon arsenic is indicated. A most convenient way of giving it is as the arseniate of iron, ⅛ grain in pill three times a day. The liquid preparations of iron are badly borne by all tuberculous patients, and do less good than might be expected.

Quinine, although it has little permanent effect on the pyrexia, is best suited to cases with irregular fever. It can be given in 5-grain doses thrice daily, either in cachet or, dissolved in lemon juice, with 15 grains of ammonium carbonate in water, so as to form an effervescing mixture. But the most pleasant way of all is that generally employed in the East, of solution in aromatic sulphuric acid. The combination of 2 grains of quinine with 1 of digitalis, to form a pill, is excellent in cases with a small, frequent, and low tension pulse. This pill is, of course, Niemeyer's famous combination, but with the opium omitted, as is best, unless diarrhœa be troublesome and depression great. Three or four of these pills may be given every day.

One other drug—guaiacol—is deserving of special mention. Creasote in capsules or dissolved in cod-liver oil is good, but guaiacol is better, and less likely to irritate. Guaiacol carbonate is an agreeable form, of which as much as a drachm can be given daily, but the best formula is—

Guaiacol	...	...	... ♏ij—x.
Rectified spirit...	...	...	ʒss.
Water ...	..	...	... ʒss.

This mixture can be given two or three times a day after food, and seldom disagrees if care be taken to begin with small doses of the guaiacol, gradually increased as toleration is established. I have several times seen great improvement follow its use, especially in acute cases. But while these drugs of general value are being given some special symptom is sure to claim attention.

If the night-sweats be not checked by acids and quinine, the first thing to be tried should be a glass of port-wine negus, given at bedtime every evening. The patient should·be sponged about the same time with vinegar and water, or, if we wish to be elegant, dilute acetic acid and eau de Cologne.

The prescription that is most frequently successful is that of a pill—to be taken in the evening—composed of—

Zinc oxid.	...	...	... gr. iiss.
Ext. bellad.	...	...	... gr. ⅓.
Ext. gent.	...	...	... q. s.

The dose of the zinc oxide and belladonna may be increased, if needed, or ⅛ gr. of morphia acetate substituted for either ingredient, or a pill containing $\frac{1}{60}$ gr. of atrop. sulph. can be given. Dr. Brunton recommends the excellent plan of giving at night liq. strych. combined with opium, and pills containing hyoscine, hyoscyamine, picrotoxin (gr. ⅙), agaricin (gr. $\frac{1}{12}$), or gelsemine (gr. $\frac{1}{60}$) sometimes succeed when other drugs have failed. Pilocarpine has been advocated, and the addition of 5 grains of Dover's powder to the negus is of use, even if it be not·agreeable.

At the best our treatment of night sweating is unsatisfactory, and our knowledge of its ultimate pathology not much better. The current explanation scarcely explains why so many patients sweat profusely in the early stage of their disease, when fever is slight, and not in later stages when fever is marked; and I cannot see that the sweating of the early stage of phthisis is quite the same as that of the last stage·of all.

In this last stage the hectic is as much due to the infection of the·cavities by pus cocci as any

other cause. In the early stage, before breaking down has commenced, it can only be due to absorbed products of the tubercle bacilli themselves. In the intermediate stages, when products of caseation are being coughed up and streptococcic infection has not yet taken place, absorption of chemical products would naturally be less. I am therefore inclined to regard sweating rather as a direct manifestation of toxæmia than as due to the nocturnal fall of temperature. The ordinary nocturnal ebb of the body's functions would probably by itself be sufficient to determine the time of the sweating.

Cough being a reflex act designed to remove harmful matter from the air-passages, it follows that a cough checked is not always a cough well treated. But it is nearly always expedient to secure a night's rest by giving, the last thing in the day, a linctus containing morphia. Either of these formulæ will be found useful :

(1) Liq. morph. acet.   ...   ...   ℥viij.
    Ether. chlor.   ...   .   ℥vj.
    Succi limon.   ...   .   ℥xv.
    Mucil. acac. ad ...   .   ℥j.
              Dose—℥j.
(2) Morph. acet.   ...   .   gr.$\frac{1}{16}$
    Ac. hydrocy. dil.   ...   ...   ℥ij.
    Oxymel scill.   ...   .   ℥xxx.
    Aq. ad ...   .   ℥j.

Unless there be a tendency to hæmoptysis it is best not to give morphia mixtures during the day, but to employ a simple preparation containing either acid and oxymel, or ammonia and squill. It should be remembered that acids check, and alkalies promote, pulmonary secretion. It is best, then, to reserve the combinations of ammonia for cases with secondary bronchitis, when the following prescription may be used :

    Tr. hyoscyami   ...   .   ℥xx.
    Sp. chlorof.   ...   .   ℥x.
    Mist. ipec. c. ammon. ad   ...   ℥j.

If the sputa be very tenacious an alkaline draught, taken in warm water on first waking in the morning, will be found to loosen the secretion and prevent retching from continued cough.

Such a draught may be composed of—

    Sod. bic....   ...   .   gr. x.
    Sod. chlor.   ...   .   gr. iij.
    Eth. chlor.   ...   .   ℥v.
    Aq. anisi.   ...   .   ℥j.

One should, however, seek to reduce as much as possible the amount of medicine taken into the stomach, and in the treatment of cough there is ample opportunity for alternative methods. Nothing gratifies patients more than the simple liquorice and aniseed lozenges familiarly known as the "Brompton Blacks." Equally pleasing, and of rather more benefit, is the use of a Yeo's respirator on which some volatile fluid has been dropped, for half an hour several times a day.

Useful formulæ are—

(1) Ol. eucalypti   ...   ...   50 parts.
    Sp. chlorof.   ...   ...   50 ,,
(2) Ol. pini sylvestris   ...   50 ,,
    Sp. vini rect.   ...   ...   50 ,,
(3) Menthol...   ...   ...   20 ,,
    Ol. olivæ   ...   ...   80 ,,

About twenty drops of any one of these combinations may be used on each occasion ; but as they are all stimulating and expectorant, none of them should be prescribed if hæmoptysis have recently occurred.

Excellent sedative inhalations can be made by adding succus conii ℥j, tr. lupul. ℥ij, or tr. hyoscyami ℥j, to ℥viij of boiling water with a few drops of chloroform in a Maw's porcelain inhaler. However, a morphia linctus by night and a simple lozenge by day may be all that is required. But, to recapitulate : Ipecacuanha and hyoscyamus and the warm alkaline draught if there be much secondary bronchitis ; sedative inhalations and acid mixtures if there be old cavities to dry up ; and stimulant inhalations and alkaline mixtures if secretion be not adequately removed, have each and all their place. Two other measures which relieve cough should not be forgotten ; the vigorous painting with liq. iod. of the chest wall over an old and irritating cavity, and friction with a stimulating liniment if much chronic pleurisy exist.

Hæmoptysis is, perhaps, the most striking of the special events incidental to phthisis. When it is slight in amount, and little more than a staining of the sputa, the blood is usually derived from the bronchial arterioles, and little treatment is required. But certainly every fatal attack, and probably every serious one, is due to the rupture of an aneurysm of some branch of the pulmonary artery. The pathology of these aneurysms and

their rupture is interesting, and determines the treatment of hæmoptysis. The aneurysms are by no means always due to the strain on an unsupported artery so generally described in the textbooks. In many cases tubercular arteritis is the cause of the primary yielding of the arterial wall; and clinical experience shows that the final rupture frequently occurs when the patient is getting well, or, in other words, at a time when we know that the systemic arterial tension is relatively high, and when we may assume that the pulmonary arterial tension is also raised. The reduction of the pulmonary vascular area by fibrosis must also tend to raise the pulmonary arterial tension, and it is a well-established clinical fact that cases of fibroid phthisis are particularly liable to profuse hæmoptysis.

At the same time, the fatal rupture of a pulmonary aneurysm has been known to occur at every stage of the disease, and even at a time when repeated and careful examination has failed to detect abnormal physical signs.

One other point has a most important bearing on treatment. Death from hæmoptysis is death by asphyxia, never death by syncope. Therefore, should an attack occur, at once lay the patient down and, if possible, hang the head low so that blood may run out from the air-passages. See that the most diseased lung—presumably the site of the hæmorrhage—is undermost, so that the relatively healthy one may be available for respiration. Keep the patient still, and withhold food and stimulants. Ice may be sucked, but ice-bags on the chest do no good and needlessly annoy the patient. It is quite absurd to imagine for one moment that ergot, iron, mineral acids, lead, or tannin can do anything to check the flow of blood through a rent in an aneurysm which can scarcely boast a muscular fibre. One drug—morphia—can and should be freely given. Hæmoptysis is alarming enough to bystanders: how much more so, then, to the patient—devoid of speech, gasping, swamped in his own blood, and expecting instant death? Morphia rapidly quiets the pulse, lessens the patient's receptivity, and, by stopping cough, allows clotting to take place around the aneurysm—the only mechanism by which the hemorrhage can be arrested. A quarter or a third of a grain of morph. acet. should be given at once, hypodermically, and the linctus morphinæ in drachm doses every four

hours. There is one other measure that can hardly ever be omitted. We know hæmoptysis usually occurs when arterial tension is high. There is no more frequent cause of high tension than constipation, and no better means of lowering tension than a purge. This should be given as soon as possible, and the best prescription is that of half an ounce of castor oil with or without ten drops of laudanum. It is better, and you will have fewer cases of hæmoptysis, if your patients never become constipated; but if they do, lower their tension by a purge as soon as possible. After all this no food should be given for twelve hours at least; then a little milk and soda, and thin bread and butter spread with Brand's essence of beef may be allowed. Complete rest must be enforced for three days, and it is well to continue with the special dietary for that period at least. If a second attack follow on the first the same treatment ought to be prescribed, and when, as is often the case, small quantities of blood are repeatedly spat up, it is of use to blister the chest-wall over the supposed site of the hæmorrhage with liq. iodi.

Not unfrequently, when an attack of hæmoptysis is impending, a peculiar character of the pulse may be recognised; it is quick, frequent, and of high tension, though not large. Should this be noted, the patient ought to be put to bed, purged, and given a small dose of morphia. You will then have the gratification of avoiding, or at least controlling, the threatened attack.

No account, however brief, of the treatment of phthisis can be complete without some allusion to the treatment of cases with laryngeal infection. In these cases very great improvement, and sometimes permanent cure, can be effected by painting the diseased parts with a 50 per cent. solution of lactic acid once or twice a week. But suitable cases must be chosen; those with solitary ulcers are the most promising.

Lactic acid can do no good if generalised or epiglottidean ulceration be present, and may even be dangerous by setting up œdema and spasm. Tubercular interarytænoid tumours are but little affected by lactic acid.

It is sometimes necessary before applying the acid to make a preliminary application with a laryngeal brush of a 20 per cent. solution of cocaine. In all cases the manipulations should be carried out with the aid of the laryngoscope, and care be taken

to limit the application to precisely the part it is desired to treat.

If for any reason treatment with lactic acid be thought inadvisable, a great deal may be done for the patient by allowing him the constant use of the menthol respirator. Continental enthusiasts have claimed many cures for this method; it unquestionably relieves pain and dyspnœa.

In advanced cases, in which cure may not be even hoped for, an effort should at least be made to eliminate the septic factor from the laryngitis. This may be attempted either with the respirator or with antiseptic insufflations. One of the best of the latter is made up of iodoform 1 grain, boric acid 1 grain, and starch in powder 2 grains.

Patients sometimes find iodoform disagreeable and boric acid irritating; if so, a laryngeal spray of silver nitrate in solution—one grain to the ounce—may be prescribed.

In all diseases pain drives one to the use of morphia; in laryngeal phthisis it is best applied locally with the insufflator. In many respects the pistol insufflator is the most convenient instrument to use; but as the amount of powder discharged by it is uncertain, when morphia is prescribed it is better to use the old-fashioned glass instrument, through which a definite amount can be blown.

The best vehicle for the morphia is sugar of milk:

> Morph. acet. ... ... gr. ⅙.
> Sacch. lactis ... ... gr. ij.
> Make a powder for insufflation.

The use of morphia will secure a good night's rest, but other means should be employed to prevent pain on taking food. It is a mistake to restrict the patient to liquids; solids are often taken best.

A few minutes before each meal the patient should either suck a lozenge containing $\frac{1}{60}$ gr. of hydrochlorate of cocaine, or have his larynx sprayed with a 2·5 per cent. solution of that drug. The plan of allowing the patient to suck liquids through a tube while lying on his stomach does not answer very well.

For the relief of dyspnœa either the menthol respirator or one of the sedative vapours should be prescribed.

Surgical interference is very rarely of any use, and tracheotomy is nearly always followed by a rapid spread of the pulmonary disease. The ade-

quate treatment of phthisis is so huge a subject, that to even allude to much more that might be done would lead me to trespass far longer than I have done on your time.

But if we wish to treat phthisis with any degree of success under the conditions we have been considering, we should always bear one rule in mind. It is this: Never allow a single symptom to continue without making some effort to abolish its cause, or, at least, to diminish its severity.

NOTES.

The Temperature in Measles. — Auguste Bourgeois, who has made a study of the course of the temperature in measles, maintains that the progress of the fever is different from that set down in the text-books. The period of incubation, he says, is not always without symptoms; for several days the temperature may be between 100·4° and 102·2° F., but on this point we must be guarded until observations have been made upon persons absolutely healthy before being seized with the disease. The stage of invasion, he says, does not always show a decided remission on the third day. The temperature may rise gradually from the day of the invasion to that of the eruption, or it may at the outset stand at the point that it is to remain at throughout the two stages. The eruptive stage may be prolonged and intense, and the temperature may remain at 104° F. for four or five days. The defervescence, whether sudden or by lysis, is remarkable for the fact that the temperature is lower in the evening than in the morning.—*Thèse de Lyon*, 1897; *Lyon médical*, October 17th, 1897.

"Tabloid" Chemical Food (Phosphates Compound). Burroughs, Wellcome & Co.—This "tabloid" overcomes all the objections which have been raised to the syrup or fluid form of this valuable combination of the phosphates of iron, calcium, potassium, and sodium. There is no difficulty in securing its administration regularly and without objection on the part of young or sensitive patients who cannot or will not take fluid medicines. The dosage can be regulated with exactness and without fear of error, since each "tabloid" contains an accurately adjusted quantity of each of its ingredients.

THE CLINICAL JOURNAL.

CONTENTS.

A NOTE FROM THE CLINIC

OF

MR. PEARCE GOULD

AT THE MIDDLESEX HOSPITAL.

A HEALTHY single woman, æt. 30, in June last noticed pain in the right knee. A fortnight later she found a small swelling on the outer side of the head of the tibia. She consulted a doctor, who gave her iodide of potassium and painted iodine on the swelling. No improvement took place, the pain got worse, and the swelling slightly increased through the month of July. In August and September, while away for a holiday and resting, her pain was better, and she thought the swelling got less; but in October, when she went back to her work, the pain returned with more than its former intensity, and the swelling increased. When admitted to the hospital a tumour about the size of a hen's egg was found occupying the highest part of the space between the right tibia and fibula, smooth in outline, soft in consistence, fluctuating, and immovably fixed to the tibia, and very tender. On very gentle pressure pulsation was to be felt in it. The skin over it was unaltered. There was no sign of expansion of the tibia. There was no

fluid in the knee-joint. The movements of the knee and ankle were unaffected. There was one small hard gland over Scarpa's triangle. There was no sign of disease elsewhere. She suffered severe pain of an aching, boring character, and this pain was worse at night. It was also made worse by exertion, and if she had much walking in the day, the following night was passed in great distress.

In considering the diagnosis it was thought that the swelling might be an abscess, a cyst, an aneurism, or a sarcoma.

The history was thought to be too short to warrant the conclusion that an abscess had formed in the head of the tibia and had burst through the bone on its outer side. Such a course, too, is extremely rare in abscess in the head of the tibia, which tends to burst through the inner surface or into the joint. There was also no evidence of tubercle in this patient. A cyst was excluded on the ground of the position of the swelling, the healthy state of the joint, the severe pain the patient suffered, and the pulsation in the tumour. Aneurism was excluded by reason of the seat of the tumour as well as by the absence of the usual signs of aneurism. The diagnosis of sarcoma of the tibia was arrived at in view of the rapid progress of the case and the pulsation in the tumour on quite light palpation ; the pain that the patient suffered is known to be quite a usual accompaniment of this disease. These tumours are often so soft that they give a perfect sense of fluctuation. It was impossible to say whether the tumour was a central or a periosteal growth.

To establish the diagnosis beyond doubt, an incision was made over the lower end of the tumour, and on dividing the upper part of the tibialis anticus muscle the grey surface of a soft sarcoma was exposed ; a little further examination showed that this tumour sprang from the interior of the bone, for the handle of the knife readily passed by its side into the centre of the tibia. The leg was then removed close above the condyles of the femur by Lister's modification of Carden's amputation. The alternative course of freely re-

moving the growth from the tibia was considered
and rejected. In the first place, to have removed
a sufficient length of the upper end of the tibia
would have left an entirely useless limb; but the
growth might have been scraped away from the
cancellous tissue of the tibia. If it had been shut
in by the compact layer of the tibia, or even by the
periosteum, this operation might have been suc-
cessful, and therefore justifiable; but as the growth
had already extended into the muscle, it was felt
that simply to remove the tumour would have
exposed the patient to a certain risk of speedy
recurrence, and amputation would then have been
done under less favourable circumstances. Where
central sarcomata can be removed entire within a
capsule of bone or periosteum the operation is
oftentimes successful, but where the growth has
spread beyond the bone to the soft parts around,
these limited operations have not been successful.

The enlarged gland noticed in Scarpa's triangle
was not removed. Sarcomata of bone very fre-
quently infect the lymphatic glands, and this
occurs especially in connection with periosteal
sarcomata of the femur. However, it is quite
common to meet with slight enlargement of glands
above a sarcomatous growth, which subsides after
the removal of the sarcoma, and it was hoped that
in this case the glandular infection was of this
simple irritative kind; if the gland does not dimin-
ish, still more if it shows any sign of growth, it
will be at once freely excised.

N.B.—We learn that a week after the amputa-
tion the enlarged gland could no longer be felt.

Detection of Spermatic Fluid.—According
to Lecco ('Therapeut. Monatshefte,' October,
1897) it is easy to recognise spots of spermatic
fluid, even after the lapse of some years. The
following microchemic test is peculiarly sensitive.
The spot should be soaked in water, and a drop of
the solution introduced between the microscopic
slide and the cover-glass; next, a drop of a
saturated solution of iodine in potassium iodide
is allowed to flow under the cover-glass—a number
of remarkably beautiful crystals which are cha-
racteristic of spermatic fluid will then be formed.
They are stained brown, and are rhomboidal in
form, often occurring in the form of crosses.
After the discovery of this reaction Lecco learned
that Florence had independently made a similar
discovery.—*Medical News, N. Y.*, Dec. 4th, 1897.

HEART DISEASE DUE TO ALCOHOL.

BY

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THE occurrence of a general dilatation and hyper-
trophy of the heart, due to the chronic abuse of
alcohol, is a subject which has received but little
attention in English text-books of medicine. This
may be partly due to the fact that these cases are
less common here than they appear to be in
Germany, especially in Munich, where they were
described several years ago by Bollinger as idio-
pathic hypertrophy and dilatation of the heart.
He found that out of 1000 post-mortem examina-
tions there were 46 of generally enlarged heart,
which could not be accounted for by valvular
disease, arterio-sclerosis, nor granular kidney;
noting that the majority of cases occurred in
brewers' men and in those who had unusual
opportunities of drinking large quantities of beer,
and that it was very uncommon in women, he
concluded that excessive indulgence in beer was
the real cause of the condition. He was also so
impressed by the rapidity with which the heart
might fail that he states that many cases ended
fatally in less than a month after their first sym-
ptoms. Fisher ('Guy's Hosp. Rep.,' vol. li) col-
lected several cases with post-mortem examina-
tion, and since his paper the post-mortem
records of that hospital show numerous examples,
few of which, however, were recognised as such
during life. Steel ('Med. Chron.,' 93, vol. xviii) gave
a good clinical account of the condition and the
details of twenty-five cases; few of them, however,
were fatal. Lately Aufrecht ('Deutsch Archiv für
klin. Med.,' Bd. liv, Heft 6) has called attention
to alcoholic myocarditis, and considers that all
the cases in question are due to the direct action
of alcohol upon the muscles of the heart, pro-
ducing a chronic interstitial myocarditis, and so
gradual cardiac failure. Bauer ('Pract.,' Feb., 1894,
p. 50) considers that idiopathic enlargement of
the heart starts as a dilatation and lessening of the
elasticity of the cardiac wall, which leads to hyper-
trophy. He further states that many of the cases
are acute, and appear well till a few days before

death ; that post mortem he found no change in the heart muscle, and that he considers them to be caused by acute cardiac paralysis due to alcohol.

Clinical history and physical signs. — A large majority of cases have been well-developed fat men between the ages of 25 and 50, who have not only drunk freely for years, but also done heavy work. In the earliest stage of the disease the patients complain only of shortness of breath on exertion, and perhaps a little discomfort in the præcordium, by which they become aware for the first time of their heart's action. On examination nothing wrong may be found with the heart, and any slight increase in its size may be entirely hidden by emphysema, which, as Babcock (' Pract.,' Jan., 1895, p. 448) pointed out, is nearly always present. In other cases some enlargement of the cardiac dulness can be demonstrated; the heart-sounds at the apex may be simply weak and fœtal—the first sound closely resembling the second ; or, more rarely, a short soft systolic bruit is heard. Slight œdema of the ankles may be present, and perhaps some enlargement of or tenderness about the liver. At this stage the symptoms are generally ascribed in the various cases to gastritis, slight heart failure due to over-work or secondary to emphysema, to valvular disease due to old endocarditis or to early cirrhosis of the liver ; and as the patients at this stage often respond well to treatment, and recover completely under rest, purgatives, and a lack of opportunity of drinking to excess, the true cause is generally overlooked. Many patients suffer several such attacks, others pass in a few weeks or months from apparent robust health to the advanced and final stage of heart failure. The general appearance of patients at this stage is fairly uniform, though there is nothing in it characteristic of the cause. The face has a bloated look, and is often markedly cyanotic ; there is orthopnœa, though little distress ; attacks of cardiac asthma at night are not infrequent, but anginal pain is extremely rare. Some patients become irritable and obstinate, and even light-headed at night, and give much trouble by their frequent attempts to get out of bed ; this is generally a bad prognostic symptom. Œdema is marked ; it may be confined chiefly to the legs, or- may be equally extensive in the scrotum, loins, and upper extremities.

The size of the heart may be very difficult to ascertain by percussion, owing to subcutaneous fat and emphysema, but even then marked epigastric pulsation and venous pulsation in the neck will point to enlargement of the right side, and very often a diffuse cardiac impulse, whether weak or forcible, can be made out displaced outwards and to the left. On auscultation no murmur may be present, but the cardiac rhythm and sounds are modified so as to produce a bruit de galop, or weak fœtal sounds. In other cases there may be a systolic bruit over the mitral or tricuspid areas, or sometimes in all areas. In other cases, though very rarely, an imperfect presystolic bruit has been heard at the apex. The pulse may be of normal tension and regular, though more often it is of low tension, rapid, and sometimes irregular : the radial artery is not thickened. The urine is scanty and of high specific gravity, it generally contains albumen in large or small quantity ; granular and hyaline casts may also be found. The lungs are often emphysematous, and some bronchitis or œdema of the bases is also present. The liver is nearly always enlarged, often tender. A high degree of ascites is not a frequent occurrence.

Diagnosis.—When such a case in its advanced condition is first seen the diagnosis is generally doubtful ; there is obvious failure of the cardiac muscle, and the question is as to what is the cause of that failure. The possibilities that are generally considered are chronic nephritis with secondary heart failure, old valvular disease with failing compensation and chronic bronchitis, and emphysema with dilatation of the right side of the heart. If the patient die without improving, it is generally left for the post-mortem examination to decide between them ; but should he improve a little under treatment, then grave doubts may arise whether any of the three diagnoses can be correct. The albumen, which may have been plentiful at first, may rapidly diminish and even disappear, and the urine become normal in constituents though rather scanty ; this makes chronic nephritis unlikely. If a mitral regurgitant bruit still persists a diagnosis of chronic mitral disease may be made in spite of an absence of history of rheumatic fever or chorea, but the fairly regular, not very rapid pulse, which the majority of these cases have even at their worst, may make it difficult to accept mitral disease as the explanation. If, however, a sup-

posed mitral bruit disappears, as it may do, or never was present, then we turn to the lungs as a possible cause. There is one source of error in connection with right-sided dilatation which was pointed out by Goodhart ('Guy's Hosp. Rep.,' vol. l), and which is very necessary to remember. He shows that when the right ventricle enlarges, the left ventricle is not only pushed to the left, but also posteriorly, so that the right ventricle comes to occupy nearly the whole præcordium ; in this way a labouring first sound or systolic bruit heard at the point of the cardiac impulse may not belong to the left, but to the right ventricle. If, however, in the case we are considering there is no history of repeated bronchitis, and but little emphysema, we have to give up the lungs as the cause, and failing any signs of arterio-sclerosis we are driven to think of some disease of the cardiac muscle itself. Only three are usually considered, namely, fatty and fibroid diseases, and rheumatic myocarditis, or what amounts to very much the same thing—an old universally adherent pericardium. Between these three it may be very difficult to diagnose clinically, and to a large extent we have to depend on the history of the case. The absence of a history of rheumatic fever or chorea makes adherent peri-cardium and rheumatic myocarditis unlikely. Fibroid disease is more often a cause of sudden than gradual cardiac failure, and in a young or middle-aged man is rare apart from a history of syphilis and signs of arterio-sclerosis of the first part of the aorta. Fisher points out in his cases the interesting fact that of the suddenly fatal cases of fibroid disease in no instance did the heart weigh more than sixteen ounces, but in the cases that terminated by slow cardiac failure the heart never weighed less than eighteen ounces. Fatty de-generation of the heart muscle is a complication of other conditions rather than a primary disease in itself, and even if associated with a generally dilated and hypertrophied heart could hardly be looked upon as the real cause of the cardiac enlargement, In general obesity, however, the heart may suffer like the rest of the body, and the infiltration and weakening of its walls may lead to its general enlargement.

In all cases of failure of the cardiac muscle, then, in which there is a markedly alcoholic history or signs of chronic alcoholism, it is well to consider whether the alcohol may not be in part or wholly respon-sible for the condition. If other causes of failure are present there is good reason for thinking that the alcohol may have helped materially to pre-cipitate the cardiac breakdown, but in cases in which no other adequate explanation can be given we ought to consider whether we are not dealing with cases of dilatation and hypertrophy of the heart due to the chronic abuse of alcohol.

On post-mortem examination the kidneys and arteries are found to be healthy, but, as Pitt pointed out, the kidneys may be hypertrophied and weigh as much as 16 ounces. The liver is generally nutmegged and but rarely cirrhotic, which is a remarkable fact when we consider that many of the cases have drunk heavily for twenty years, showing very well the selective action of alcohol and similar poisons. The heart weighs between 14 and 25 ounces ; all its cavities are dilated and hypertrophied, the valves and coronary arteries are healthy, though the mitral and tricuspid orifices may be incompetent owing to the dilatation of the ventricles. The cardiac muscle, according to Bollinger, Fisher, and Bauer, may be perfectly normal, not only to the naked eye, but also microscopically. Aufrecht, on the other hand, found in all his cases hyper-trophy of the muscle-fibres and their nuclei, increase of the connective tissue, thickening of the smaller arteries with increase of nuclei in their walls, and finally pigmentation of the muscle-fibres. In other cases fatty degeneration of the muscle-fibres has been found.

The *prognosis* even in the early stages is very uncertain. Some cases after one or more slight breakdowns get permanently well if they stop drinking alcohol ; others recover, for a time, at any rate, from even the most serious stage of heart failure. Bauer, on the other hand, states that many of the cases appear quite well till a few days before death. Bollinger thought that many cases only lived a few months or weeks after their first symptoms. Fisher thinks that one year is the average duration ; whilst Aufrecht says that three to five years is not at all unusual, and that the cardiac failure is a slow and progressive process. Probably all of these statements are true of dif-ferent cases, and the rapidity of failure depends on how the myocardium and cardiac nerves are affected, and on the presence or absence of other causes, such as strong physical exertion and ex-cessive smoking. At any rate, it seems clear that

the length of time that alcohol has been drunk to excess has far less to do with the prognosis than the rapidity and severity of the symptoms of failure when they first appear.

When we turn to the *pathology* we meet with numerous questions to answer. How does alcohol produce dilatation and hypertrophy of both sides of the heart? which is primary, the dilatation or the hypertrophy? and is alcohol alone a sufficient cause, or are there others? How is it that in some cases we get such rapid death, in others a more gradual failure without microscopic changes in the myocardium, and in others a well-marked myocarditis or fatty change?

Roy and Adami (' Brit. Med. Journ.,' February, 1888; 'Lancet,' January, 1892; 'Trans. Roy. Soc.,' 1892) have obtained some very important information on the subject of the work of the heart, and the causes of its dilatation; several different factors have to be taken into account. In the first place they showed that increasing the systemic blood-pressure produces a dilatation of the left ventricle and increases the intra-ventricular tension,—that is, the heart is larger during diastole and also during systole because more blood remains in it (increase in the residual blood), and it does not contract up to its former size; but the output of blood at each systole of the ventricle remains the same. This dilatation of the ventricle with the same output of blood from it decreases the work of the heart, because a heart with a circumference of ten inches, if it contract up one inch during systole, will expel four times as much blood as a heart of five inches in circumference contracting up the same amount; therefore a dilated ventricle, to expel the same quantity of blood, need not contract up so much. This decrease in work, however, is counterbalanced by the fact that the tension in the walls of a dilated ventricle has to be greater to raise the blood-pressure in the ventricle above that of the aorta. They also showed that if the systemic blood-pressure is further increased the left ventricle dilates still more, until the mitral and ultimately the tricuspid valve is no longer competent. Results exactly similar to those produced by increasing the systemic blood-pressure are brought about by diminished power of contraction of the ventricles due to weakening of their walls. Next they showed that increasing the quantity of blood or fluid in the vascular system, apart from any

question of blood-pressure, increases the work of the heart; and they showed that by injecting 50 c.c. salt solution into the veins of the dog, they increased the work of the heart 30 per cent., also the diastolic expansion of the ventricles, though the blood-pressure was not raised at all. (This cannot be used as an argument against transfusion, because the effect on the heart of suddenly increasing the fluid in the vascular system is quite different when the systemic blood-pressure is much below normal before the injection.) Conversely, although venesection does not reduce the arterial blood-pressure, by reducing the quantity of blood in the systemic veins, it decreases the residual blood in the ventricles, and so the work of the heart. An effect exactly similar to that of injecting fluid into the veins is brought about by emptying the abdominal veins. They found that simply pressing the abdomen increased the output of blood by the heart 50 per cent., and it is therefore probable that physical exertion entailing contraction of the abdominal muscles and compression of the abdominal viscera by deep inspirations will produce the same effect. It must be kept in mind that increase of output, such as results from increasing the total volume of blood in the body, increases to a corresponding degree the work done by both ventricles; but that a rise of systemic blood-pressure will, in the absence of secondary mitral regurgitation, only affect the left ventricle. Beyond a certain limit, however, increase in the work of the heart due to increase in the volume of blood thrown out in a given time tends to fatigue the organ, and unless counteracted will lead to dilatation of both ventricles and incompetence of the mitral and tricuspid valves.

Under ordinary circumstances, whenever the ventricles get into difficulties from overwork the vagi come to their assistance. Moderate stimulation of the vagi brings about some inhibition of the auricles, and their less perfect contraction, by means of which less blood is sent into the ventricles and the pressure in the great veins is raised; it also slows the ventricles and increases the residual blood in them, but the vigour of the ventricular contractions remains unimpaired. In this way the dilated ventricles can expel a larger quantity of blood at each contraction, but the output in a given time, and consequently the work of the heart and the general arterial blood-pressure,

are reduced owing to their slowing. As Gaskell showed, the vagi are the anabolic or trophic nerves of the heart, and when their stimulation is over the vigour of the heart is increased, and the whole cardiac action is improved. This protective action of the vagi has a limit, and if their stimulation is too strong the auricles are further inhibited, and the ventricles take on an independent slow rhythm of their own, and the heart's action is put out of gear. The augmentor nerves, on the other hand, are the katabolic nerves of the heart; their stimulation increases the rate, the vigour of contraction of the auricles and ventricles, and so the work of the heart. Thus they improve the circulation generally at the expense of the heart, and unless they were counteracted again by the vagi would exhaust it. In considering the mode of interaction of these two nerves it is necessary to distinguish sharply their effect on the rate and the force of the beats. When the vagi are cut or paralysed, and their restraining influence removed, the rhythm of the heart is increased, and the augmentor nerves have then no control over the cardiac rhythm because they can only act by inhibiting the influence of the vagi on the rhythmic centre of the heart. But in the case of the force of the heart it is different; both sets of nerves can act directly and independently on the force of the auricles, but the force of the ventricular contraction is directly affected by the augmentor nerves alone: the vagi act on the ventricles indirectly by inhibiting the augmentor influence. But at best the augmentor nerves can only be a temporary measure for improving the beat of the heart, their continued action would be fatal to the strength of the heart unless the cause of their coming into operation were removed, or hypertrophy occurred to· take their place.

There is one further question to consider, namely, how does physical exertion increase the work of the heart, and how does the heart meet it? The work is increased partly by increase in quantity of blood reaching it from the great veins, and partly by the rise of arterial blood-pressure due to contraction of certain vascular areas; this is met by stimulation of the augmentor nerves, which increases the force of the beats, and in certain cases the rapidity of the rhythm. Sometimes the increase in force of the ventricle more than counterbalances the heightened resistance to its contrac-

tions, but in other cases the increased force of contraction does not fully counterbalance the increased work thrown on it, and the ventricle dilates. This physiological dilatation in spite of augmentor action must be distinguished from the physiological dilatation which may be produced without accompanying augmentor action, e. g. by increasing the total quantity of blood or intra-venous injection of salt solution. We know, however, that the heart can by judicious training be greatly strengthened, so that its force of contraction effectively counterbalances for a longer period the increase in work thrown on it during exertion: this increase in power is due in part at least to hypertrophy of the cardiac muscle. In a healthy heart fatigue and physiological dilatation are synonymous; in a diseased heart the degree of dilatation of its cavities is in inverse ratio to its power of doing its work, but in both cases dilatation per se places the heart in an unfavorable position for meeting physiological increase in work thrown on it.

Now if we apply these results to the cases in question we see that the first effect on the heart of its having too much work to do, whether from causes peripheral to itself or from its own muscular weakness, is to produce dilatation of one or both ventricles. The internal pressure which a hollow sphere or approximate sphere can exert on its contents varies inversely with its diameter; in other words, the more the ventricles dilate, the greater work will their walls have to do to expel the blood into the arteries. Also the strain on the walls of a hollow spherical shell increases uniformly with the circumference; in other words, the resistance to contraction of the ventricular walls becomes greater as the circumference is increased. It is this physical fact which explains why an aneurism always tends to increase in size when once it has started to form. Dilatation is then the primary condition, and a condition which tends to increase continuously except in so far as it is compensated for and held in check, first by augmentor action and then by hypertrophy. If the strain on a heart, whether healthy or diseased, is too great from the beginning, hypertrophy will have no time to develop, augmentor action may not meet the case, and we shall have acute dilatation of the heart with rapid failure. If, on the other hand, a sufficient hypertrophy have time to develop, and as long as the cardiac muscle remains unexhausted,

the circulation will be maintained by the dilated and hypertrophied heart. Between these two extremes we get in various cases every intermediate condition of failure and partial compensation. We have then to ask, how does chronic alcoholism in some cases increase the work of the heart or decrease its efficiency so as to lead to its failure? There is no evidence that it raises the arterial blood-pressure apart from granular kidney and arterio-sclerosis, but there is some evidence that it may act in at least three ways.

1. By a direct action on the muscle-fibres of the heart. Aufrecht's observations make it almost certain that a chronic interstitial myocarditis occurs as the result of chronic alcoholism, and there is equally no doubt that fatty degeneration is also found in the enlarged hearts of drunkards; but there is no conclusive evidence that either of these changes is brought about directly by the poisonous action of the alcohol on the tissues of the heart. Similar changes in the liver, however, due presumably to the direct action of alcohol, makes the supposition extremely likely, and the poisons of diphtheria, scarlatina, rheumatic fever, and other toxic conditions are found to produce like changes in the heart. But when we discuss the effect of peripheral neuritis of the vagi on the heart we shall see that both a myocarditis and fatty degeneration may possibly be due in some cases to this cause. Moreover fatty degeneration of the cardiac muscle is not infrequently found in the dilated and hypertrophied hearts due to valvular disease and other causes of cardiac failure, and is probably a degenerative process liable to occur in muscle ill-nourished and failing from whatever cause. But apart from any gross or microscopical change in the myocardium, there is evidence that alcohol does effect it directly, for Roy and Adami showed experimentally that alcohol causes a primary weakening of the ventricular contractions, and if given in sufficiently large doses induces a dilatation which in itself, and without increase in physical exertion, may lead to functional incompetence of the auriculo-ventricular valves. They found that nicotine produced the same effect. It is possible that some of the very acute cases reported by Bollinger and Bauer may have been of this nature, the rapid cardiac failure being precipitated by some physical exertion, and no microscopical change in the myocardium being found post mortem.

2. By poisoning the cardiac nerves. There is no evidence that peripheral neuritis affects the sympathetic nerve-fibres, therefore we have to consider neuritis of the vagi alone. In man the vagi contain not only efferent fibres from the cardio-inhibitory centre, the anabolic or trophic fibres, but also the depressor fibres, which are the afferent or sensory nerves of the heart, by which when in difficulties it stimulates the cardio-inhibitory centre and inhibits the vaso-motor centre, which reduces the blood-pressure by vaso-dilatation in the splanchnic area. Therefore, in considering peripheral neuritis of the vagi, their various functions have to be borne in mind. Gaskell found that crocodiles in whom the vagi had been cut low down near the heart died of heart failure in about nine months. Sharkey ('Trans. Path. Soc.,' vol. xxxix), in a case of sudden death from alcoholic peripheral neuritis of the vagi, phrenics, and other nerves, found active inflammatory changes in the corresponding muscles, which suggests that interstitial myocarditis and fatty degeneration might be due to this cause. On the other hand, in some cases of peripheral neuritis of the vagi due to alcohol and other causes no microscopical changes have been found in the myocardium, and yet the heart failed, and often very suddenly, which bears out the double use of the vagi to the heart; they are not only the trophic nerves, but also the mechanism by which the heart tries to relieve itself of overwork and prevent exhaustion from unopposed augmentor action, and from a blood-pressure too high for it. It is a remarkable fact that neuritis of the vagi, the sensory nerves of the heart, is not attended by more pain; it would be thought that every contraction squeezing inflamed nerves would be most painful.

3. By possibly increasing the quantity of fluid in circulation. The bearing of this, if it were the case, on the work of the heart has already been explained. Hypertrophy of the heart due to plethora has been asserted and denied. Roy and Adami from experimental evidence consider it possible, but state that they have never met with such a case. The idea at first sight seems to be conclusively negatived by the fact that diabetics, who take quite as much fluid into their system as any beer-drinker, do not get hypertrophy of their hearts; but against this it might be said that diabetics pass far more urine than alcoholic patients,

and so get rid of the excess of fluid more quickly. Both may show hypertrophied kidneys without morbid change due to increased function, and beer-drinkers generally suffer from diarrhœa, which helps them to get rid of fluid. But even if excess of fluid in circulation is not one of the initial causes of cardiac enlargement in beer-drinkers, it certainly must be an aggravating cause as soon as the heart has begun to fail a little and the excretion of urine to diminish, which is one of the earliest occurrences in cardiac failure. But that the quantity of fluid drunk is not a necessary part of the ætiology of these cases is shown by Aufrecht, who found many instances in spirit-drinkers.

The effect of physical exertion on the work of the heart has been referred to already, and as most of the cases of alcoholic cardiac failure have been in men, who also have had heavy work to do, it is probable that this has been a helping cause of the breakdown, and in some cases has determined a sudden or rapid death. Excessive smoking also seriously affects even healthy hearts, but the exact action of nicotine upon the cardiac nervous mechanism is too complicated to discuss here. It is a fact, however, that few cases of alcoholic hearts have shown any signs of cardiac pain comparable at all to tobacco angina.

With regard to *treatment* little need be said ; we can remove the cause, but we still have to deal with the effect, the cardiac failure. In slight cases, in addition to ordinary treatment for failing heart muscle, saline baths and regulated resisted movements have been found very useful in enabling the heart to contract up more completely and work at a greater advantage. In advanced cases there are two additional measures which are not used as generally as they deserve, and which theoretically and also practically do much good, namely, venesection, and a diet restricted in the quantity of liquids allowed. Both help to reduce the residual blood in the ventricles, and so enable them to work more effectively than they could do in their more dilated state.

Bacteria in Ink.—Septicæmia following a pen scratch is explained by Marpmann, of Leipzig, on the theory of the constant presence in most inks of saprophytes, bacteria, and micrococci. A bacillus was cultivated and found fatal to mice.
Medical Record, December 4th, 1897.

A CLINICAL LECTURE

ON

THE SURGERY OF THE BRAIN.

Delivered at the West End Hospital for Diseases of the Nervous System, Welbeck Street, London, November 2nd, 1897,

By EDWARD COTTERELL, F.R.C.S.,

Surgeon to the Hospital.

GENTLEMEN,—It is of course impossible to give anything but a cursory *résumé* of the subject of this lecture in the time at my disposal ; but in order to make the most of the opportunity, I have written down on the board a list of the lesions for which the surgeon usually operates, and it is my intention to touch upon them *seriatim*. You will see that the lesions include those of the skull, as well as of the brain proper.

1. Penetrating wound of the skull (without any wound of the meninges or brain).

2. Simple depressed fracture, with epileptic convulsions.

3. Fracture of the skull with rupture of the middle meningeal artery.

4. Foreign bodies in the brain.

5. Tumours of the dura mater.

6. Penetrating wound of the brain.

7. Abscess of the brain, which we may subdivide into—

    (*a*) Traumatic.

    (*b*) Tuberculous.

    (*c*) Secondary to ear disease, or some other septic lesion about the head or face.

8. Tumours of the brain, which may be classified under the following pathological groups :

    (*a*) Diathetic : Tuberculous, syphilitic.

    (*b*) Sarcomatous : Glioma, sarcoma, myxoma.

    (*c*) Carcinoma, which is rare except when secondary to carcinoma elsewhere, and in cases of this kind patients do not come to the surgeon for operative interference, because it would be useless.

    (*d*) Osteo-fibroid : Fibroma, osteoma, osteofibroma, cholesteatoma, lipoma, psammoma, neuroma.

    (*e*) Parasitic : Cysticercus, echinococcus.

    (*f*) Simple cysts.

9. Meningitis, under which head we have—
   (a) Tubercular.
   (b) Non-tubercular.
10. Jacksonian epilepsy, which is very often included in some of the other lesions I have given.
11. Infantile hemiplegia, associated with convulsions of a Jacksonian type.
12. Congenital spastic paraplegia (which may at first glance seem to be a spinal cord trouble but is really connected with the brain).
13. True microcephalus, when it is due really to the premature synostosis of the bone.
14. Infective thrombosis, generally due to middle ear disease, and affecting an intra-cranial sinus, usually the sigmoid.
15. Hydrocephalus.

First let us consider penetrating wounds of the skull. It very often happens that when a person gets a small penetrating wound of the skull, the wound heals up very quickly under an ordinary dressing and the patient apparently gets on all right; but it may happen that after a time head symptoms develop. In these cases the after trouble is due to the fact that the wound had become septic and some of the septic material had been absorbed by the lymphatics and carried into the interior of the skull, setting up a septic leptomeningitis—leptomeningitis being the term used when the arachnoid and pia mater are involved, in contra-distinction to pachymeningitis, when the dura mater only is affected. Or the poison may penetrate more deeply and produce a small localised septic abscess of the brain, which, of course, may give rise to general septicæmia. This condition, of course, would come under the heading abscess of the brain, and can be considered then. I may say that the localisation of such lesions is generally a very simple matter, as it is usually just under the external wound.

Next we have simple depressed fractures accompanied by epileptiform convulsions. These occur more often in children than in adults, because children's heads seem more prone to knocks and accidents. Thus, it is no uncommon thing for a child to fall downstairs or fall off a gate or get knocked on the head. Probably no notice is taken of the matter at the time, though the child complains of headache. However, after an interval, during which the headaches have persisted, there may be some morning sickness, and then the subject of the knock begins to get convulsions. We, of course, expect to get convulsions primarily affecting those parts which correspond to the situation in the cortex under the depressed bone. I regret I have no case of this kind to show you, but I will briefly relate one or two cases which occur to me.

Some time ago I was called to see a child 11 years of age, the history of whose case was very similar to the one I have just represented to you. The child was playing with some of its companions, and fell on to her head from off a gate. No notice was taken of the matter, but about a fortnight afterwards the child began to complain of headache, and was unwilling to go to school in the morning. The doctor who saw the patient recognised that she had a depression on one side of her head, in the nature of a general shelving in of the bone. He asked me to see the case. When I first saw her she was playing about in a room; she said she had not any headache, there had been no sickness, and indeed she seemed to be perfectly well. Moreover, as sometimes there is a little difference in the conformation of the skull on the two sides, I was a little sceptical as to whether the injury had produced the shallowness, especially as the child had a thick head of hair. And here I would like to mention that if you wish to thoroughly examine a child's head, or an adult's for that matter, you must insist on having the hair off, otherwise you cannot judge of any deflection in the bones produced by a lesion. I said I did not think there was any need to operate for the purpose of raising the bone in that depression, because there had been no convulsions, and the only symptoms discoverable were a little sickness and complaints of morning headache. I therefore asked that I might be informed how the child went on. I was sent for three or four days afterwards to see the little girl, and was told that the headache had become much more intense, and the sickness more pronounced. At the request of the doctor in attendance I arranged to operate on the case the following day at two o'clock. You will remember that the child had had no convulsions. At twelve o'clock on the following day she had her first convulsion, and died in it, so that my arrangement was made a little too late to save her life.

In another case I noticed a child playing about

in a room had got ptosis on one side with marked dilatation of the pupil of the same side. I asked what was the matter with the child's eye, and the mother replied that there was nothing the matter with the eye, but the child had fits ; and in reply to further questions it transpired that she had been subject to these fits two and a half years, they having commenced after a fall downstairs. The child really was in the habit of having attacks of *petit mal;* when she was holding anything she would lose herself for a few seconds and drop what she had in her hand. She had thirty or forty of these attacks in a day. In taking hold of the child's head for the purpose of examining her eye, I put my fingers into a depression of the skull. I operated upon the case and the child got perfectly well.

The next lesion on the list is fracture of the skull with rupture of the middle meningeal artery. This is not an uncommon accident. You will remember that the middle meningeal artery comes off from the internal maxillary, and it is the anterior branch of the artery which is usually ruptured. The artery goes through the foramen spinosum in the base of the skull, and passes up in a groove or channel in the bone, diverging into its various branches. If you get a fracture of the skull running across the line of the artery, you are very likely to get a rupture of the vessel. The classical symptoms of such a rupture are that the person has a slight fall, and knocks the side of his head, or he may fall downstairs, or in the street bringing his head into contact with the kerbstones. He just loses consciousness,—becomes stunned for a time. The unconsciousness is soon recovered from, and then after a little time, perhaps two or three hours, coma gradually comes on, accompanied by all the signs of compression of the brain. If you have a case with such a course you may be practically certain that the middle meningeal artery is involved. The coma is caused by the pressure of the blood between the bone and the dura mater, where a distinct clot forms, which presses the brain just over the motor area, and brings on paraplegia of the opposite side of the body. So, if the history of such a case were not brought out clearly, you might think it was an ordinary instance of cerebral hæmorrhage into the internal capsule. There are cases in which the interval between the concussion and the return to

consciousness is very slight indeed ; and many of these cases in which the history cannot be ascertained, are undoubtedly regarded as apoplexy. A late secretary to this hospital fell down and fractured his skull, at the same time rupturing his middle meningeal artery, at a railway station one night, and was arrested by the police on a charge of drunkenness and. locked up all night. As a result of this the unfortunate man died. I quote this as a not very uncommon occurrence. When you have settled in your mind that there is a rupture of the middle meningeal artery, it is necessary to trephine over the line of the artery and stop the bleeding, having cleared out the clot. A good guide by which to ascertain the situation of the artery is to take the external angular process of the orbit and draw a line straight backwards for one and a half inches ; then take a line upwards at right angles to the first, and place the pin of the trephine on this line one and a half inches above the zygoma. If you do not happen on the artery by this means, you must enlarge the trephine opening and search for the vessel, for it is essential that the bleeding be stopped.

Foreign bodies in the brain—generally gunshot wounds—do not often come under the notice of the surgeon in civil practice, except as a result of suicide or accident; but it is a class of injury which is much more frequent in military work. I shall therefore pass this section by.

Tumours of the dura mater are rare. When they occur they may go through the dura mater and perforate the bone. In operating upon such cases one has to take away the bone and the part of the dura mater involved. There is nothing of special importance in the surgical procedure.

Penetrating wounds of the brain must be treated on ordinary surgical principles. In an ordinary penetrating wound of the skull causing symptoms by depression of the inner table, the surgeon must trephine and get away the internal table which is causing the damage, for if only a small puncture is apparent externally it will be sure to be found that the fracture of the inner table is very much more extensive than the external wound might lead one to suspect. Spicules and fragments of bone piercing the brain cause irritation of the cortex and set up epileptic convulsions, especially if it happens that the motor area is under the depression.

We now come to abscess of the brain. This may be either traumatic, tuberculous, or secondary to ear disease or other septic process in the region of the head or face. An abscess may form as a result of a penetrating wound of the skull, and there is generally no difficulty in deciding where to trephine, because there is the outside wound as a guide.

Tuberculous abscess. In people who are the subjects of tuberculous disease, a deposit of tubercle may take place in one or more spots in the brain, and the focus breaking down will produce a tuberculous abscess. The localisation of such lesions I will deal with when I come to speak of tumours.

Abscesses of the brain secondary to ear disease. The most common situations of abscesses due to this cause are in the temporo-sphenoidal lobe or the cerebellum. I think it will be better for me not to dilate upon this part of the subject, but to leave it for Dr. Grant to deal with in the lectures which he is to deliver to you.

Meningitis comes under two heads, (a) tubercular, (b) non-tubercular, but from the point of view of surgical treatment there is no difference. As a rule, tubercular meningitis is a very fatal disease. It has been suggested that as the coma which the children, who are the subjects of this affection, suffer from is due to the pressure of the fluid in the meninges and in the subarachnoid space, and therefore that it is probably good surgery to drain off that fluid, and so relieve tension. Moreover, it seems tolerably certain that the mere fact of drawing off the fluid has a good effect by killing the tubercle bacilli, for you know that in tuberculous peritonitis the mere opening of the abdomen and release of the fluid will often cure the case. In meningitis there are two methods of withdrawing the fluid. The first is known as spinal puncture, which I do not propose to speak of to-day. The second is by opening the occipital fossa with a trephine and then passing a probe between the lobes of the cerebellum, and by this means opening up the large subarachnoid space found in that situation. This will enable you to drain off the fluid, and some successful instances have been recorded. Dr. Ord, a former physician to this hospital, published a case in the 'Medical Transactions' with Mr. Waterhouse. We had a case at this hospital in which the procedure was attempted, but unfortunately it was not successful.

Jacksonian epilepsy, as you are aware, is an epilepsy which commences generally in one muscle or group of muscles. For instance, these fits may, in a particular individual, always commence in the thumb and spread themselves to other parts ; or the fits may be confined to one arm for a time, the whole body becoming affected with the convulsive movement at a later period of the convulsion. The name is due to the fact that Dr. Hughlings Jackson was the first to describe it, more than twenty-two years ago ; but very little was done in the way of operative procedure for its cure until within the last few years, which have seen such a rapid advance in brain surgery. We know that to cause these peculiar fits there must be some lesion affecting a part of the motor area. For instance, if the fits commence in the thumb we know that the lesion must be somewhere about the middle third of the Rolandic area, generally in the front of that area. Jacksonian epilepsy may be caused by many of the conditions to which I have alluded : for instance, a penetrating wound of the skull may cause a depression in the arm centre and give rise to Jacksonian epilepsy ; or there may be concussion with a slight laceration of the brain substance in some part of the Rolandic area, which may result in a scar, and that scar may give rise to the Jacksonian symptoms. When the Jacksonian epilepsy is due to bone trouble or ordinary pressure, it is usually easily relieved by simply raising the depressed bone. If the symptoms are traceable to a scar of the cortex, the area must be opened up and the scar removed. Where there is any difficulty in finding the centre to be removed, it may be discovered by taking the two poles of a faradic current battery and touching the various parts of the brain, when a part will be found where the current causes a convulsion corresponding in its type to those suffered from. The exact spot having been found, this part of the cortex is removed, and generally the result of the surgical interference is the cessation of the fits.

Next we come to infantile hemiplegia associated with convulsions. Dr. Outterson Wood had a very interesting case in this hospital, that of a child aged 3 years and 3 months, suffering from hemiplegia accompanied by epilepsy. At birth labour was easy and natural, and the child was quite well

until one year old, when it fell from the top of a hayrick ; she then had an epileptic seizure, and afterwards was hemiplegic.   Two years after this she was brought to the hospital, and one could see, when the head was viewed from behind, that the skull was distinctly flattened on the left side. Dr. Wood asked me to see the case, and I explored the Rolandic area and found a cyst in the meninges filled with serous fluid, which apparently was situated in the arachnoid membrane. The cyst was dissected out, and after the operation the dura mater was stitched up except at the lower angle, into which a drain of catgut was inserted.   The child was collapsed after the operation, but quickly rallied.   A large amount of cerebro-spinal fluid escaped, but the wound subsequently completely healed.   The child got perfectly well, can run about as well as most children, without limping, and there has been no return of the seizures.   I also had a case in the hospital recently, and I had hoped to show you the patient, but have been disappointed as he has not arrived.   In this case the fits began in the left hand, the left side being paralysed, so I operated on the right side.   Upon raising the dura mater all that I could find was that there were some adhesions between the dura mater and the brain. The child afterwards got quite well, and entirely lost his fits.

Congenital spastic paraplegia is our next subdivision, and I arranged for a case to be here, but again I am disappointed.   The condition is due to hæmorrhage at birth, generally in the meninges at the top of the brain, and affects the leg centres on both sides as a rule.   You know the classical symptoms of this spastic paralysis.   The child is always late in his efforts to walk, and when he contrives to get along at all he has adductor spasm, and so has a cross-legged progression.   If you sit a subject of this condition in a chair and tap the legs they go out perfectly rigid, and when bent beyond a certain angle suddenly flex—clasp-knife rigidity. By pressing up the feet you can overcome that spasm.   At one time it was suggested that it would be a good thing to cut the tendo Achilles, but this is not necessary, as there is no shortening of the calf muscles, the apparent talipes equinus being only due to spasm of the calf muscles.   In the case which I hoped to show you, I had an idea that the hæmorrhage had set up so much irritation that

if we opened the dura mater over the site of the hæmorrhage we could relieve some of the symptoms.   It was a typical case of spastic paraplegia, and had the clasp-knife rigidity of which I have spoken.   I operated on only one side, so that I might see what was the result.   So far the effect has been very good indeed, because the child has no spasm in its thighs now at all, and can run about on its hands and knees with great agility, so that I shall be disposed to operate on the other side of the brain later on.

Tumours of the brain.   Some of the tumours of the brain which I have included in the list are fairly common, others are simply pathological curiosities.   Our chief interest with tumours of the brain is whether they can be removed or relieved by operation.   The classical symptoms of tumour in the brain are headache, vomiting, optic neuritis, and affections of speech.   For instance, sometimes the subjects of tumours of the brain divide their syllables, and at other times they distinctly clip their words.   The patient may have hemiplegia, and may have convulsions ; where there are symptoms of brain tumour *plus* paralysis, you may say there is a tumour in the cortex.   But that does not follow, because the tumour may be in the pons, or in the crus, or in the internal capsule. Other factors have to be taken into consideration, such as the character of convulsions when present, the occurrence of spasm of a certain group of muscles combined with paralysis.   Before operating upon a tumour of the brain, certain questions arise, and the first one would naturally inquire into is the certainty of there being a tumour.   As a rule, the physician makes the diagnosis and the surgeon is called in to remove the tumour.   Then as to the localisation of the lesion, we can generally localise tumours which occur in the motor area, and those which occur in the sensory zone ; but growths affecting other parts of the cerebrum as a rule cannot be localised with precision.   In a lesion affecting the motor area, if there be a local clonic spasm, and the epilepsy commences with localised spasm followed by paralysis, with early headache and tenderness and pain, it is a cortical lesion ; but where there is local hemiparesis followed by spasm, and the spasm is of a tonic variety, and the pain, tenderness, and headache are not very marked, it is probably a subcortical tumour.   Tumours of the brain may be either

single or multiple. If there be multiple tumour it is useless to attempt relief by operation, as, for instance, in a case of this description :—the patient has all the signs of tumour of the brain,—vomiting, sickness, headache, optic neuritis, hemiplegia on the right side, spasms commencing in the right arm or in the thumb, all pointing to a lesion of the left motor area,—and then the patient gets difficulty in deglutition or some laryngeal trouble; it is probable that there are two lesions, one in the motor area, and the other in the medulla affecting the vagus nerve. You may remove the tumour in the cortex, but it would be bad surgery, as that in the medulla is too deeply situated for surgical interference.

I will now say a few words about the operation itself. There are certain difficulties to encounter. First, one has to decide how much bone to take away. As a rule, for these operations you must take away plenty of bone; half the difficulty of brain operations is due to not removing sufficient bone, so that one's movements are cramped.

One reason for removing a comparatively large area of bone is that there may be considerable hæmorrhage, and with a small area of bone removed the source of it may be hidden. Again, if after opening the skull it is found that the tumour cannot be removed, many of the symptoms are often relieved by the opening of the skull, removing intra-cranial tension. Then as to the anæsthetic. Brain operations are very serious, and give rise to much shock ; it is therefore important to know which is the best anæsthetic; it is essential to use one which does not engorge the vessels of the brain. Those who have seen the human brain when the patient is under ether will not fail to remember the enormous engorgement of the vessels and how every little venous radicle is swollen into a comparatively large vein. The best anæsthetic for this class of operation is chloroform. In order to do with as little chloroform at the operation as possible, it is wise, in the case of an adult, to give about an hour beforehand a small dose of morphia subcutaneously. Where morphia is contra-indicated for any reason, it may be well to give one drachm of liquid extract of ergot an hour before the operation. The hæmorrhage from the scalp when you turn down the flap is often very profuse, because the scalp is very liberally supplied with blood-vessels. This bleeding must

of course be stopped before you can proceed with the operation. I always put an elastic tourniquet on the skull. Many surgeons do not use it because they say it is not reliable, but I think it is because they have not found the proper tourniquet. I have tried all sorts of contrivances, india rubber tubes with pads of different sizes, and so forth, but I have found they generally slip just in the middle of the operation. I find that the ordinary silk elastic one inch wide, wound round on a level with the occiput and forehead five or six times, each layer of course bringing greater pressure, practically prevents bleeding from the scalp at the time of the operation. This is a very important matter, especially in children, because the loss of blood so largely increases the shock. I have done many operations on children's heads without losing half a drachm of blood, by using this tourniquet which I have described.

Next comes the difficulty in detecting the growth. You may have opened the skull and dura mater without being able to see the tumour. Some sub-cortical growths, such as fibroma or tubercular tumour, are very much more easily detected than others, as they can generally be detected by palpation. Glioma, on the other hand, may be difficult to detect, owing to its frequent resemblance to normal brain substance.

Suppose there is a growth under the cortex ; you palpate and use your fingers until you find indications of its presence, and then you incise the cortex over the area of the growth and endeavour to remove it, which, if it is encapsuled, may be comparatively easily accomplished.

Some growths of the brain are very difficult to get away, because they are not encapsuled. When, therefore, you have to remove a large part of the brain together with the tumour, the question of arresting hæmorrhage which must occur arises. The method of preventing hæmorrhage from the brain substance and the pia mater is to pass stitches, a little outside the area to be removed, for three-quarters of an inch in depth into the brain. Then you can excise the growth with but little hæmorrhage.

An important point is the preparation of the patient. The subject of the operation must be got ready in the ordinary way. The bowels must be opened, and liquid food given for a day or two before. It is most important to have the *whole* of

the head shaved, because whatever hair may be left would probably readily make the wound septic. After shaving the head, it is thoroughly washed with soap and water and afterwards with ether, and then packed for twenty-four hours with a 1 in 20 carbolic compress. This compress is changed once or twice, and is not removed finally until the patient is brought into the operating theatre and everything is ready for operating.

As to the incision into the scalp, it was the practice to make a cross-cut and hold the four pieces of the scalp apart. We do not do that now-a-days, but make a large ∩-shaped incision, and turn down the whole of the tissues, including the periosteum, in the flap ; this enables the surgeon to see what he is doing. With regard to removing the bone, there are various ways ; some surgeons like an electrical saw, and all sorts of ingenious arrangements are made for the purpose of opening the skull. I believe the modern pattern of the trephine is the best instrument to use. If necessary, you can afterwards enlarge the opening by bone-cutting forceps. Moreover, I think the surgeon who uses the new mechanical and electrical machines is very apt to forget how to use his own hands, and machines often break down at the critical moment.

Having removed the bone, the dura mater is opened simply by lifting it up with the forceps and cutting it with a pair of scissors well within the line of bone incision.

After the tumour has been removed the brain substance generally bulges up into the opening. I very seldom sew the dura mater down again, simply laying it on to the brain. In the ordinary way in this hospital we do not dress the wound again till ten days after the operation, by which time it has generally healed. I place an ordinary piece of ligature catgut twisted into a hank to form a drain, in the posterior corner of the flap, to enable the serum to drain away.

With regard to sewing the scalp wound together afterwards, I always do this before I take the tourniquet off, and use for a suture ordinary ligature catgut, and while I take the tourniquet off I keep up pressure with the dressings over the site of the wound. By following out that course of procedure I have never had any hæmorrhage, or required to ligature a vessel in the scalp.

WITH MR. MARMADUKE SHEILD AT ST. GEORGE'S HOSPITAL.

Empyema of antrum and frontal sinus ; free openings ; prolonged suppuration ; great relief to symptoms ; persistent frontal sinus. — A widow æt. 56 was admitted into St. George's Hospital under the care of Mr. Marmaduke Sheild in November, 1896. Her symptoms dated from the previous January, when after a bad attack of "influenza" she suffered severe pain over the right side of the face, followed by a sudden discharge of blood and pus from the nose. The pain was very severe. The antrum on the right side had been tapped through the alveolus, and a small tube inserted, through which the cavity had been washed out with but poor and inefficient results. The woman was much depressed in health. There was slight bulging of the right cheek, and depression of the palate, with tenderness on pressure. The right lower turbinal was much hypertrophied, and pus could be seen hanging about the middle meatus. Heyring's lamp showed a dark rounded opacity on the right side.

On December 6th a free opening was made into the antrum above the bicuspid region, large enough to admit the finger. The cavity was lined with a livid and thickened pyogenic membrane, and full of thick inspissated yellow pus of the consistence of cheese. The curette was used, the cavity flushed, and a large tube inserted. Some diseased teeth were at the same time removed. The hypertrophied portion of the lower turbinal was also taken away.

For ten days the tube was retained, the cavity being well washed out with solution of peroxide of hydrogen. The tube was then replaced by a smaller one ; the discharge was inconsiderable. On the 22nd of December it was obvious that freely as the operation had been performed, the opening was not sufficient, for the symptoms began to return with renewed violence. On the 29th another operation was performed, and a full-sized trephine applied, removing the greater part of the front wall of the antrum. A quantity of pus and unhealthy granulation tissue was again removed with the curette, and a free opening was made into

the inferior meatus of the nose at the same time. The cavity was temporarily plugged with iodoform gauze.

A large tube was afterwards inserted, and the cavity flushed daily with peroxide of hydrogen. Notwithstanding the size of the opening it again rapidly contracted, so that in ten days the nozzle of a syringe could only be inserted. The patient was, however, much relieved, but was still subject to violent attacks of neuralgic pain over the face and head.

The pain was of the most excruciating nature, and was only relieved by doses of antipyrin and caffeine; such drugs as quinine, chloride of ammonium, gelseminum, and carbonate of iron were tried from time to time, with varied degrees of benefit.

On January 20th, 1897, the patient left for the Wimbledon Convalescent Hospital, and she remained there through February and March. Great care was exercised in flushing out the antral cavity, and the discharge from it had practically ceased by April. It was obvious, however, that further mischief remained. The attacks of pain continued, and were of the most violent nature, referred vaguely to the right side of the head and face. On April 10th the patient was again seen. The opening into the antrum had greatly contracted, and there was scarcely any discharge. There was only slight fever. The most noticeable feature was the intense pain in the head and over the face, coming on in violent paroxysms, the patient crying and moaning, and holding her head in her hands. It was difficult to locate the pain, which closely resembled the paroxysms of trigeminal neuralgia, but there was marked tenderness on pressure over the frontal sinuses, though no local signs of mischief, as bulging or swelling, &c., could here be discovered. Accordingly it was resolved to explore the right frontal sinus, and this was done on April 12th. The bone was of considerable thickness and density, and on entering the sinus the lining membrane was found thickened and livid, while the sinus was much dilated and full of thick, yellow, cheesy pus. The posterior wall of the sinus was very thin, and the dura mater could be felt at one spot. All the diseased tissue was thoroughly removed with a curette, and the left sinus was next opened, but it was small and atrophic, and contained only a little mucus. A

large opening was made into the middle meatus of the nose, and a piece of tubing the size of a cedar pencil passed through. The vertical incision was employed in opening the sinus. The cavities were swabbed out with pure carbolic acid, and iodoform dusted in. The immediate effect of the operation was to abolish the severe pain from which the patient had previously suffered.

The further progress of the case was as follows :

The nasal tube was retained for a month. Occasionally severe attacks of pain would come on, so that it was feared that the sphenoidal cells were also implicated. All this gradually subsided. The opening into the sinus was kept patent, and the patient washed it out daily with sulpho-carbolate of zinc. At present (November, 1897) a small sinus still exists, which is daily washed out. The appearance of the patient being of great importance to her, any radical operation, such as removal of the front wall of the sinus, cannot be entertained. Her head symptoms and severe pain are entirely removed, but the discharge is a source of great inconvenience.

The principal points of interest about this case are (1) the sinus suppuration following influenza— this case being by no means an isolated one; (2) the method of draining the antrum. It is very questionable whether the method of inserting a small tube through the alveolus is applicable to these cases. Mr. Marmaduke Sheild's experience of this measure has been unfavorable, the discharge continuing for months, or even years. The inspissated pus and diseased lining membrane can only be dealt with by the curette, and a very free anterior opening beneath the cheek, if needful a counter-opening into the nose being made at the same time. These openings have a remarkable tendency to contract, and can hardly be made too free.

(3) The symptoms of frontal sinus suppuration. Heyring's lamp may be looked upon as a useful adjunct in the diagnosis of antral abscess; it can hardly be relied upon in frontal sinus disease. Localised pain on pressure or percussion, and especially bulging or yielding of the bony walls, as at the inner canthus of the eye, are far and away the most reliable signs. In this case the predominant feature was facial neuralgia of the most pronounced and violent type. Some months elapsed

before frontal sinus mischief was suspected, and then the operation was purely exploratory.

(4) The best method of opening the frontal sinus is as yet *sub judice*. The difficulty we have here to meet is external deformity and scarring. Doubtless the quickest way to permanently cure these most troublesome cases would be free removal of the anterior bony wall, with the use of the curette. The soft parts, however, then sink in and form a very distressing deformity. If the bony walls are left intact, a rigid suppurating cavity long remains, and to maintain an opening patent from it into the nose is a very difficult matter. In the present case but a small weeping sinus remains, easily concealed by a piece of coloured plaster. The presence of discharge is, however, a serious nuisance.

Any further operation would consist in making a very free opening into the nose, with removal of the turbinals below to ensure free drainage, and union of the sinus anteriorly by a simple plastic operation. Finally, it may be remarked that these cases of sinus suppuration in the bones of the face are full of more difficulties both in diagnosis and treatment than the profession generally estimate. Ordinary means of drainage by small tubes and openings are tedious and usually quite inadequate.

NOTES.

Spasm of the Pylorus.— Doyen ('Médecine Moderne,' 1897, No. 43; 'Centralblatt für Chirurgie,' October 30th, 1897) states that he has made a systematic study of contracture of the pylorus since the year 1892. He has performed nearly a hundred operations on the stomach, and sixty-one of them were not for cancer. In forty-six of these there was stenosis due to spastic contracture without cicatricial changes. Only in twenty-four instances could ulceration in the neighbourhood of the pylorus have played a part in the ætiology. The pylorus was carefully examined in every case, and generally it was excised. Its orifice was from seven to ten millimetres in diameter, or even less, and this constriction was always the real impediment to the emptying of the stomach, and never the scars that were sometimes present in other situations. In spasm due to acidity the patients do not generally vomit, he says, but on taking the

least bit of food they suffer extraordinary pains, which interfere with sleep and lead to abstinence. When spasm of the pylorus does not yield to internal remedies, an operation must be performed. Recovery is to be expected if the operation is done well and at the right time, and therefore in cases of ulcer of the stomach and stubborn dyspepsia, gastro-entero anastomosis should be resorted to. Of his thirty-six most recent operations, since 1895, thirty-two have ended in recovery. One patient died of gastric hæmorrhage ten days after the operation, and the three others that died were already too cachectic at the time of the operation.—*New York Medical Journal*, December 4th, 1897.

Mixed Tumours of the Soft Palate.— Berger ('Revue de Chirurgie,' No. 7, 1897) concludes a paper on this subject with the following propositions :

The mixed tumours of the soft palate present a distinct group showing well-marked anatomical and clinical characteristics.

These tumours originate in the glandular layer of the palate, and are always encapsulated. They are epitheliomatous in nature, with a varying framework.

In some cases the epithelial elements are deposited in the manner characteristic of adenomata ; in others of that noted in epitheliomata included in a fibrous, mucous, or cartilaginous framework. These growths are essentially benign ; neither in course nor in termination do they resemble true epitheliomata. This benignity is attributable to the distinct limitation of the epithelial hyperplasia by the mucous or cartilaginous capsule. None the less these tumours can be distinguished from sarcoma only with difficulty, since the latter growth in the region of the soft palate may be slow in its progress, distinctly encapsulated, and relatively benign.

The sole danger connected with these tumours is their increase in size and consequent interference in function. Their extension toward the pharynx, the pterygo-maxillary region, and the parotid render their extirpation somewhat difficult. This operation, however, may be accomplished by enucleation, because of the distinct capsule. Local recurrence is always due to incomplete ablation.

Tumours of the hard palate are similar to those already mentioned, but they often perforate the bony vault and attack the nasal fossa and the maxilla. They are less clearly defined than tumours of the soft palate, and some of them are of the same nature, having been derived from the palatine glands ; others may be more properly classed at sarcomata, particularly the plexiform sarcoma and the angio-sarcoma (*Therapeutic Gaz.*, November, 1897).

CONTENTS.

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by the Author.*

Remarks upon the Present Position of Bacteriology in Relation to the Diagnosis of Disease.

Delivered before the East Surrey Branch of the British
Medical Association at Reigate on October 14th, 1897,

BY

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GENTLEMEN,—The object of this paper is to point out the present position of bacteriology in relation to the diagnosis of disease, so as to enable the general practitioner to know how far he can rely upon the assistance of the bacteriologist in his everyday practice.

I was tempted to choose this subject because I find it is one about which there is considerable misunderstanding. Many medical men are far too extravagant in their demands upon the bacteriologist, and expect from him information which he is unable to supply; while other medical men take the opposite extreme, and discard bacteriological evidence which would be of great value in the diagnosis, prognosis, and treatment of their cases.

I propose in this paper to take some of the

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principal bacterial diseases in order, and to discuss in each case the practical value of a bacteriological examination.

TUBERCLE.

We will begin with tubercle, for in no other disease has the value of a bacteriological examination been more thoroughly established. Nevertheless, even in this affection, fallacies may arise, and incorrect conclusions be drawn.

There are two methods usually adopted for the recognition of the tubercle bacillus:

(1) A microscopical examination.

(2) The inoculation of guinea-pigs.

The microscopical recognition of the tubercle bacillus depends upon the fact that the bacillus, after staining with hot carbol fuchsin, is not decolourised by immersion for a few minutes in a 25 per cent. solution of a mineral acid. It is important to remember that the leprosy bacillus and the so-called smegma bacillus have the same morphological characters as the tubercle bacillus, and that they possess the same staining peculiarities. It is true that they both decolourise more readily than the tubercle bacillus. Nevertheless, in some cases it is impossible to rely upon a microscopical examination as a means of distinction, and in such cases inoculation must be resorted to.

Fortunately the guinea-pig is very susceptible to tubercle, and becomes infected when inoculated with even a minute quantity of tuberculous material. The inoculation may be made either into the subcutaneous tissue of the groin or into the peritoneal cavity. Inoculation into the peritoneal cavity is the more delicate test; but this method cannot be employed with material much contaminated with other bacteria, as the animal may die from peritonitis before the tuberculous process has developed. The objection to inoculation is the length of time which must elapse before the diagnosis can be made. Guinea-pigs do not die for many weeks or even months after inoculation, but it is not necessary to wait until death takes place. At the end of a fortnight or three weeks the animal may be killed, and the diagnosis estab-

lished by the presence of tubercles visible to the naked eye, in which the characteristic bacilli can be readily found.

We must now consider the cases in which a simple microscopical examination is sufficient for the purposes of diagnosis, and those in which inoculation should be practised. As leprosy is so rare in this country, the smegma bacillus is the only micro-organism which is likely to be mistaken for the tubercle bacillus. Now the smegma bacillus is found not only in the secretions from the mucous membrane of the genitals, but also in other parts, such as the ear and nose. Consequently in suspected tuberculous lesions of any of these parts too much reliance must not be placed upon a microscopical examination. It is especially in cases of suspected tuberculosis of the genito-urinary tract that errors may arise. I have known at least one case in which bacilli having all the characteristics of tubercle bacilli, were found in the urine, but inoculation experiments gave negative results. The further clinical history of this case showed that it was not of a tuberculous nature. The error may be partially avoided by withdrawing the urine directly from the bladder with a catheter; but I believe it is wise to insist upon the proof of an inoculation experiment before making the diagnosis of tuberculosis of the genito-urinary tract.

The same remark will apply to cases of suspected tuberculosis in unusual positions in the body.

In phthisis a microscopical examination of the sputum gives, for all practical purposes, thoroughly reliable information. The discovery in the sputum of bacilli having the microscopical characters of tubercle bacilli may be taken as certain evidence of phthisis. When no bacilli can be found by microscopical examination of the sputum, the question is rather more difficult. A distinction should be drawn between cases with and cases without physical signs of lung trouble. Where there are no physical signs, the failure to find tubercle bacilli in the sputum cannot be looked upon as of much importance from a diagnostic point of view, although bacilli are often to be found long before physical signs develop. When, on the other hand, physical signs of lung trouble are present, the failure to find tubercle bacilli in the sputum is a matter of great diagnostic importance, and is sufficient evidence that the affection is not tuber-

culous. I am, of course, supposing that the examination is carefully conducted by a skilled observer, and that a sufficient quantity of sputum is examined. In doubtful cases the residue of a large quantity of sputum should be examined after treatment with borax and centrifugalisation.

We must be alive to the fact that tubercle bacilli are rarely present in certain tuberculous products. I refer especially to ascitic fluid in tuberculous peritonitis, and to the clear effusion in some cases of tuberculous pleurisy. The bacilli adhere to the peritoneum and pleura, and are frequently absent from the exudations.

In dealing with fluids containing few bacilli, such as the urine, the centrifuge is of great assistance. The bacilli, pus cells, &c., collect at the bottom of the tubes, and form a residue which can be examined microscopically or inoculated as may be necessary.

Tuberculin has been used for the diagnosis of tubercle in the human subject; but on account of its danger and uncertainty, I think its use should be limited to the diagnosis of tuberculosis among cattle, where it appears to be of great service.

DIPHTHERIA.

It is often impossible to diagnose diphtheria from clinical observation. The difficulty is especially felt in mild cases where the appearance of the throat cannot be distinguished from that of simple tonsillitis. Less frequently there occur severe forms of membranous inflammation of the fauces, which are not true diphtheria. In both classes of case the presence or the absence of the diphtheria bacillus is the only criterion.

The diphtheria bacillus can only be recognised with certainty by its macroscopical and microscopical appearance in cultivations, combined with its pathogenic action on animals. The determination of pathogenic action takes some four or five days; and were we always to wait for the result of inoculations, the bacteriological evidence would often come too late to be of any clinical value. Fortunately the evidence derived from the microscopical and macroscopical appearances of the cultivations is sufficient in most instances, and such evidence can be obtained within 18 hours.

We must consider how far we can rely upon cultivations alone in the recognition of the diphtheria bacillus.

The chief difficulty arises from the fact that there are at least three kinds of bacteria which may be mistaken for one another. These bacteria are—

1. The Klebs-Loeffler or true diphtheria bacillus, which is the cause of diphtheria.

2. The so-called xerosis bacillus, a bacillus first found in cases of xerosis of the conjunctiva. and now known to be often present in the healthy conjunctiva and in other parts.

3. Hoffman's bacillus — a bacillus frequently found in healthy and in inflamed throats. Hoffman's bacillus was originally called by its discoverer the pseudo-diphtheria bacillus, but, as this term has been applied to other bacilli, it is better to discard it altogether.

Now Hoffman's bacillus can be distinguished both from the Klebs-Loeffler and from the xerosis bacillus by a careful microscopical examination. It has no pathogenic action upon animals, and as I have always held, it has no causal connection whatever with diphtheria. It does not appear to be more frequently present in the faucial exudation of diphtheria than in the exudation from the normal throat.

At the London Fever Hospital we make a systematic examination of all the cases admitted, and over 1200 examinations have been made during the past eighteen months. I believe that the experience of this hospital quite bears out my statement that Hoffman's bacillus has no causal connection with diphtheria.

The xerosis bacillus can only be distinguished from the Klebs-Loeffler bacillus by inoculation. It has exactly the same microscopical and macroscopical appearances in cultivations, but it possesses no pathogenic action on animals. As this bacillus may be present in the healthy conjunctiva, and might easily obtain access to the throat, it would at first sight appear that cultivations without inoculation experiments are of little value in forming a diagnosis of diphtheria. But, as a matter of fact, this is far from being the case, and my experience is that the xerosis bacillus is rarely present *in inflamed throats.* I would, indeed, lay it down as a dictum that in all cases of throat affection where the clinical appearance suggests diphtheria the presence of a bacillus having the microscopical and cultural character of the diphtheria bacillus is, for all practical purposes, sufficient evidence that the case is one of diphtheria.

When the throat is not inflamed, more circumspection must be exercised, and reliance should not be placed upon evidence derived solely from the result of cultivations ; for we may mistake the xerosis bacillus for the true diphtheria bacillus, and we should await the result of inoculations before deciding that the case is one of mild diphtheria. The same remark applies to cases of suspected diphtheria in abnormal situations,— such, for instance, as on the conjunctiva.

It has been stated that diphtheria bacilli are often present in the throats of healthy individuals. I believe this statement to be misleading. I have no doubt that true diphtheria bacilli are sometimes present in the throats of healthy individuals, especially of those exposed to infection ; but I believe that the frequency of this occurrence has been much exaggerated. A confusion between the xerosis bacillus, Hoffman's bacillus, and the true diphtheria bacillus will explain these discrepancies of opinion.

It will be observed that I have refrained from saying anything about the relationship between these different bacilli. It is quite possible that they may have been developed from one another, but there is no evidence to show that one can readily be converted into another. There is no reason whatever to suppose, for example, that during convalescence the virulent diphtheria bacillus is converted into the non-virulent xerosis bacillus.

The next point I shall have to consider in connection with diphtheria is the question of the importance to be attached to a negative result of a bacteriological examination. It is rare to fail to discover diphtheria bacilli on a first examination, provided due care is taken in making the cultivation. Nevertheless, for some reason or other the cultivation may fail, and when there are clinical reasons for suspecting diphtheria a second or third examination should be made.

The only other point I will refer to is the question of the other bacteria associated with the diphtheria bacillus in the throat. No doubt these bacteria have an influence on the course of the disease, but an ordinary bacteriological examination gives no information upon this question. It is often said that the presence of many streptococci in the cultivations is of bad augury. When I tell

you that it is an easy matter to cultivate strepto-cocci from every healthy mouth, you will see that the number of streptococci found in the cultivations is of no importance in the prognosis of the case.

TYPHOID.

In typhoid fever an examination with the object of demonstrating the presence of the typhoid bacillus, seldom yields satisfactory results. The bacillus, is confined, as a rule, to the lymphatic tissues of the intestines and to the spleen—parts which are not readily accessible to examination during life. The bacilli are only present in small numbers in the fæces, and the difficulty of separating them from the *Bacillus coli* renders an examination of the fæces useless for the purposes of diagnosis. In severe cases the bacilli appear in the urine, and an examination of this fluid by plate cultivations will reveal their presence, but in such cases the diagnosis is apparent from clinical grounds. Again, the bacilli can be found in certain complicating lesions, especially in osteomyelitic foci or periosteal nodes, but by the time these complications have arisen all doubts of the nature of the disease have been dispelled. The chief cases in which the diagnostic value of the discovery of the bacillus is of importance are cases which die without intestinal lesions. Here an examination of the spleen will reveal the presence of the bacilli, and no doubt systematic bacteriological examinations would clear up the cause of the disease in many cases of so-called innominate fever.

Although the search for the bacillus is of practical value in only a certain number of cases of typhoid, there is a more valuable method due to bacteriology. I am referring to the serum test. This test depends upon the fact that the blood-serum of animals immunised to the typhoid bacillus when added to an emulsion of the typhoid bacillus causes them to clump together in small masses. The blood-serum of patients suffering from typhoid has the same effect.

In order to apply the test, a sample of the patient's blood is obtained by pricking the ear, the skin of which has been previously sterilised by washing with lysol, and afterwards with alcohol. The blood is drawn into a sterile bulbous tube, and, after clotting, the serum is allowed to separate. The serum is then diluted with sterile broth, a drop is added to a drop of a broth cultivation of the

typhoid bacillus, and the mixture is examined under the microscope. A reaction consists in an accumulation of the bacilli into little clumps.

If the serum is sufficiently diluted, and the examination is carefully conducted, the test yields most valuable information. It is necessary to dilute the serum because undiluted normal human serum may cause some clumping. When this precaution is taken, a reaction is very strong evidence that the patient is either suffering from or has previously passed through an attack of typhoid fever. A negative result is not of so much value, for the reaction is not present all through the disease. It is rarely present during the first few days, and the period at which it appears and again disappears is variable.

STREPTOCOCCAL INFECTIONS.

In various septicæmic conditions it is necessary, from the point of view of treatment and prognosis, to determine what micro-organism is the cause of the infection. At the present time perhaps the most important point is to determine whether the infection is due to the *Streptococcus pyogenes*, for in such cases treatment with antistreptococcic serum may be beneficial.

Now the *Streptococcus pyogenes* closely resembles the pneumococcus in its microscopical and cultural characteristics, and I believe the one is often mis-taken for the other. It is, however, possible to distinguish these micro-organisms by careful exa-mination combined with inoculation experiments.

Still more difficult is the distinction from a strep-tococcus often present in the vagina, and always present in the normal mouth. Indeed, in some cases the distinction is impossible in the present state of our knowledge. Consequently, the discovery of a streptococcus in exudations from the throat or in discharge from the vagina is no evidence that the infection is due to this micro-organism. On the other hand, when we are dealing with pus from such situations as the pleura or the subcutaneous tissue, the discovery of the streptococcus can be relied upon as evidence of a streptococcal infection.

PNEUMOCOCCAL INFECTIONS.

I have already stated that the pneumococcus may be mistaken for the streptococcus, but that by careful observations the distinction can be made. The recognition of the pneumococcus is of especial importance in cases of empyema ; for an empyema

due to this micro-organism is almost certain to run a favorable course, while with an empyema caused by the *Streptococcus pyogenes* the prognosis is more serious. Apart from the question of prognosis the recognition of the pneumococcus is of importance in reference to treatment with antipneumococcic serum—a treatment which in the future will probably have a wide application.

The question arises whether it is possible to diagnose a true pneumococcal pneumonia by a bacteriological examination of the sputum. Inoculation of animals does not give reliable information, because the pneumococcus is not infrequently present in the secretion of the normal mouth. It is only in a certain proportion of cases in which capsulated diplococci are present in abundance in the sputum that a diagnosis can be made by bacteriological methods.

There are many other diseases—such as cholera, anthrax, and glanders,—in which a bacteriological examination is of value for diagnostic purposes, but the time at my disposal is now drawing to a close.

Before concluding, I would ask your permission to say a few words about the collection of material for bacteriological examination, as the success of the examination depends to a great extent upon the collection being performed in a suitable manner. The medical man should be provided with sterile tubes, pipettes, and swabs, such as I am now showing you. Aseptic precautions should be observed in collecting the material, and the admixture with antiseptics as far as possible avoided. When the material is liquid, a little should be sucked up with a sterile pipette, or with a sterile swab, and should be placed at once in a sterile tube plugged with cotton wool. The exact method is a matter of no great importance so long as the principle of preventing contamination with foreign bacteria is borne in mind.

In conclusion I would say that I have endeavoured in this paper to point out some of the difficulties of bacteriological methods, and to show that you must use judgment in interpreting the result of such examinations. You must be satisfied that the bacteriological investigation has been carefully and skilfully carried out, and your diagnosis must rest upon the whole of the circumstances of the case, of which the bacteriological examination is only one of the links in the chain of evidence.

WITH MR. STEPHEN PAGET, F.R.C.S.,

AT THE

WEST LONDON HOSPITAL,

October 20th, 1897.

GENTLEMEN,—During the last three months I have had many serious cases at this hospital, and among them were six that ended in death. I submit to you first these fatal cases, for we cannot fail to note and remember them; and then some other cases that were of especial interest.

Of the six fatal cases, one was a very severe burn of the whole body. The other cases were as follows:

1. Cancrum oris.
2. Cerebral abscess.
3. Pyæmia.
4. Secondary hæmorrhage from rupture of the liver.
5. Fracture of the thigh with rupture of the femoral artery and vein; death after amputation.

I put these five cases together for this one reason, that they all ended in failure. Each one of them, therefore, forces us to consider it very carefully, and to ask whether something more might not have been done for the patient.

1. *Cancrum oris.*—This was the case of a little girl, 8 or 9 years old, who was sent to me on September 8th by Dr. Mackintosh, of Mortlake. He had in vain urged the parents, when he first saw the child, to allow some operation to be done before it was too late; they would not hear of it. Her condition on admission was frightful; she was wasted to a skeleton, and almost comatose. The whole of the right cheek was destroyed, and had become a black, pulpy slough; the masseter was gangrenous, the teeth were falling out, the palate was invaded, the periosteum was ripped off the horizontal ramus of the jaw, both back and front, so that the bone stood up bare and grey and wholly devoid of blood; the tongue was ulcerated, the state of the child seemed altogether hopeless. Her history is of importance, because it lets us know the pace at which the disease went. Nothing had been noticed till the Friday before admission, when it was found that the child's jaw was swollen. Dr. Mackintosh saw her that evening, and there was then a black spot on the inside

of the cheek. Next morning the gangrene had reached the outside; there was a dusky red patch, which rapidly turned black; and in twelve hours more the whole of the cheek was gangrenous. This was on Saturday night; the child was admitted on Tuesday. I removed the slough at once, cutting it out with scissors, and then swabbing the large gap with pure carbolic acid. There was no bleeding; we saw the mouths of the coronary vessels and the facial artery standing out from the edge of the gap, thickened and wide

operation; but it shows clearly the half-conscious typhoidal look of the child, the wasting, and the terrible extent of the disease. Moreover there were signs that the lungs had become affected by the foul discharge from the mouth. Yet the child recovered, after we had cut away the whole slough and had well swabbed the gap with nitric acid. Afterward, I did a plastic operation, and closed the gap with a large flap taken from below the jaw, and she is now quite a nice-looking child. The two cases appeared almost equal: and our

Fig. 1.

open, and bloodless. But the removal of the slough was too late to save the child; she had profuse diarrhœa, and sank and died early the next morning.

In cases of true cancrum oris this excision of the slough is our only chance. I have here a photograph of a case (Fig. 1) under my care two or three years ago. This patient also was a little girl, 8 or 9 years old; the disease had come after typhoid fever, and had been treated for eleven days with boracic fomentations. The photograph was taken in a hurry, just before

only hope of success is the immediate excision of the disease.

2. *Cerebral abscess.*—This patient, a girl 10 or 11 years old, was also sent to me by Dr. Mackintosh, and was admitted on August 17th. There had been a discharge from her right ear, off and on, for many years: and this had been wholly neglected. She had begun to be ill ten days before admission, with headache, but not vomiting; finally, she became unconscious, and then at last her parents sought advice for her, and she was sent here at once. There was optic neuritis. She was

unconscious, and was not roused by shouting. There was distinct loss of power on the left side; the limbs moved when one pinched them, but the left limbs moved more slowly than the right, and through a smaller range of movement, and it took a harder pinch to make them move. The temperature was 103°, which made us fear that there was not only cerebral abscess, but also other intracranial inflammation. The child's condition was so bad that I decided to explore the temporo-sphenoidal lobe at once, and if I found pus there to do nothing further for the present; and the end of the case showed that I was right, and that nothing could have saved her life. The dura mater was extremely tense, bulging into the wound, and showing no sign of pulsation. I passed a director downward toward the petrous bone for about two inches, and ten or twelve drops of very fœtid pus ran out. I enlarged the track a little, and put in a tube. The next day she was less feverish, and showed some signs of consciousness; but the day after, we found brain tissue sloughing through the trephine hole, and next day she died. The *post-mortem* examination discovered purulent meningitis at the base of the brain, thrombosis of the lateral sinus, and sloughing of the entire temporosphenoidal lobe; caries of the petrous bone, and pus in the middle ear.

3. *Pyæmia.*—This patient, a boy 12 years old, was sent to me a few days ago by Dr. Owen of Hampton. A week before admission, he had come home from school complaining of pain in the right leg. Dr. Owen did not see him till three days later; there was then general swelling of the limb, and a slight abrasion of the heel, which was doubtless the starting-point of the infection. Next day, the swelling of the whole limb had increased, and especially around the knee, and there was fluid in the knee-joint. The boy's general condition was very unfavorable. Dr. Owen made incisions into the knee-joint, and let out a small quantity of pus; but this made no improvement in the general symptoms. On admission, the boy was delirious, wasted, with quick shallow respiration, dry brown tongue, pulse 120, temp. 104°. He had a very strange rash on him, unlike the rashes that sometimes occur in septicæmia and pyæmia. It was both macular and tuberculated, a mixture of small purplish round spots and of well-defined raised nodules in the skin; these nodules were of the same dusky tint as the maculæ, and felt like small shot or small peas beneath the skin. The rash faded on pressure; it was mostly on the front of the trunk, and was not thick-set: there were a few spots on the flexor aspect of the arms, and large raised dusky patches up the anterior inner aspect of the right lower limb, along the course of the long saphena vein. There were no physical signs either of pneumonia or of pericardial effusion.

I enlarged the incisions in the knee-joint, let out some pus, and passed a tube through the joint; but next day the boy's condition was even worse than when he was admitted; the rash was thicker and more extensive, and he died the next day. At the *post-mortem* examination, pus was found not only in the knee-joint, but also in the pericardium. The lungs to the naked eye appeared healthy; and there was no sign of pus in any other joints. The bones showed no trace of epiphysial disease; we must therefore suppose that this was a case of acute pyæmia. and that the abrasion on the heel was the source of infection.

4. *Secondary hæmorrhage from rupture of the liver.*—A boy 10 years old was run over by a heavy van, and was admitted here at once. It was certain, from the bruising, that he had been run over about the region of the liver; and he was badly collapsed. But next day he was in every way much better, and all thought of operative interference was out of the question. Moreover, he behaved in a way that seemed wholly inconsistent with any serious internal injury; he was always asking to be allowed to get up and to have solid food, and he was always moving about in bed, refusing to lie still.

On the fifth day after his injury, he had a sudden rise of temperature to 103°, and that day he was very pale, and felt ill. Next day the temperature was normal, and he felt and seemed to be in good general health. About this time we noted a strange sign in him; I have not come across any account of it in similar cases. He complained of pain in the back of his neck, on the right side; it appeared to be a muscular pain, somewhat deep-seated, such as one gets in a common stiff neck: and I think that the muscles here were a little fuller and firmer to the touch than on the left side; but I am not certain about this. But the strange thing was that when one made pressure over this

tender painful place in the neck he complained at once of pain over the front of the liver, putting his hand just below the right costal arch. He was quite clear about this; and, though it sounds fanciful, it may be true that there was in his case a sort of reversal of that nervous connection which we know exists between the liver and the parts about the shoulder-joint.

He had a persistent dry irritable cough, and "was always coughing." I do not know exactly when this cough began, but certainly he had it three or four days after the injury, and coughed frequently.

On the eighth day he seemed very fairly well, but now we noted a slight extension upward, about the axillary line, of the liver dulness. This was taken, rightly, to be due to a slight pleural effusion.

On the ninth day, as his temperature was normal and he seemed well in himself, he was moved into a cot, as his bed was urgently needed for a grown-up patient. This did not do him any harm.

On the tenth day I let him sit up in a chair; his cot was not quite so comfortable for him as his bed had been, and it seemed to me that he would keep as quiet sitting up as lying down. About half an hour later, he suddenly showed signs of internal hæmorrhage, and died before any surgical treatment could be carried out. The *post-mortem* examination showed fluid blood in the peritoneal cavity, and serous fluid in the right pleura; over the right side of the liver was a layer of tough dark clot, and the liver was lacerated in two places, one in front, the other behind.

I would call your attention to the fact that ten days had elapsed since the injury. The patient had a cough, and was unwilling to lie still in bed; and I believe that the onset of the hæmorrhage was in no way due to his sitting in a chair. Yet I am bound to put the whole case before you.

5. *Comminuted fracture of thigh; rupture of femoral artery and vein; death after amputation.* —This case was certainly one of the most difficult and distressing cases that a surgeon can ever have to face. The patient was admitted here on September 27th, having been run over by a heavy waggon. He was fifty-five, and looked much older; he was blind of one eye with cataract, and he was known to be given to drink. Thus we had to deal with

a man wholly unable to stand any intense prolonged shock. When I saw him, a few hours after admission, he was in frightful pain; I have seldom seen worse pain. There was no doubt as to the nature of the injury; the whole right lower limb was cold, pulseless, and livid; the thigh was distended to enormous size by a huge extravasation, mostly on the anterior and inner aspects of the limb, almost as high as the tuber ischii, and almost as low as the popliteal space. The femur was fractured about the junction of the middle and lower thirds. There was no evidence of internal injury, no bruising of the trunk. The patient was past the immediate shock of the injury; he was in terrible pain, and the tense mass of effused blood was still forcing its way up the limb.

If we did nothing, he would die of pain and shock; if we gave him enough morphia to stop the pain he would perhaps die of morphia poisoning, and if he did not, yet the limb would rapidly become gangrenous. If I cut down along the course of the vessels to find the source of the hæmorrhage, consider the danger of this method. We had to deal with a patient who was prematurely old, and was given to drinking. It was impossible to know exactly where the vessels were ruptured; the extravasation was of enormous size, the muscles were lacerated, the femur was fractured. Free incision might be followed by such hæmorrhage that he would die at once; or at least, if the hæmorrhage were at last restrained, he would be left unable to stand the shock of subsequent amputation. It appeared to me that the patient must either be left alone, or must submit to primary amputation; and that the amputation, seeing that the extravasation reached almost to the tuber ischii, and we did not know with any accuracy where the vessels were ruptured, must be at the hip-joint. Below the hip-joint the muscles were lacerated and loaded with blood, and we could not hope to get flaps here that would heal well. I tied the common femoral to begin with,* while Mr. Price transfused the patient. Then I amputated the limb. We found the femur broken into three fragments, and the femoral artery and vein ruptured. The ends of

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* I did this some years ago in another case of amputation at the hip-joint which was successful; and it certainly has some advantages.

the artery were two or two and a half inches apart ; the upper end was twisted and firmly closed, the lower end was open and showed no sign of contraction. The muscles were severely lacerated, or caught between the fragments of the bone. The patient lost but little blood during the operation, but sank and died very soon after it.

Let me put clearly before you the difficulties of this case. First, the patient was prematurely old, and was given to drinking. Next, he was in frightful pain, such as could be subdued only by the continuous administration of an anæsthetic, or by such doses of morphia as might of themselves be fatal. Next, the huge extravasation was still going on ; therefore we could not hope, by temporising, to put him in a better condition to stand the shock of operation,—if anything was to be done, it should be done at once. Then comes the question,—was it right or wrong to amputate without first making an attempt to find the source of the hæmorrhage ? The femur was fractured, the muscles were torn and crushed, it was impossible to know with any accuracy at what point the vessels were ruptured, and how far the torn ends had retracted ; it would have been necessary to make incision into a huge cavity full of clots, with the chance of such hæmorrhage as might be immediately fatal. Even if we were so

he would certainly not survive the amputation. There is yet another question that rises out of this case. Would it be advisable in such cases to apply continuous pressure over the common femoral, or to tie it, and thus gain time enough for the patient to be in a better condition for amputation ? I have no reason to think that my patient's life could have been saved by this method, for it was the lower end of the artery that was open ; the upper end was firmly closed. Nor would he have stood continuous pressure. Yet simple ligature of the artery might in less desperate cases avail to carry the patient over the next few hours.

I have now quoted all the fatal cases that have been under my care here during the last three months ; and I put them together, though they are so dissimilar, just because they compel our attention as successful cases never do. Next come a few other cases of great interest.

6. *Lacerated wound of the abdomen and pleura.* —This young man was admitted under me six weeks ago, having fallen from a window on some area palings. He was suffering severe shock, and was wounded in two places.

(i) On the left side of the back, between the scapula and the spine, was a small lacerated wound, leading into a large irregular cavity undermining
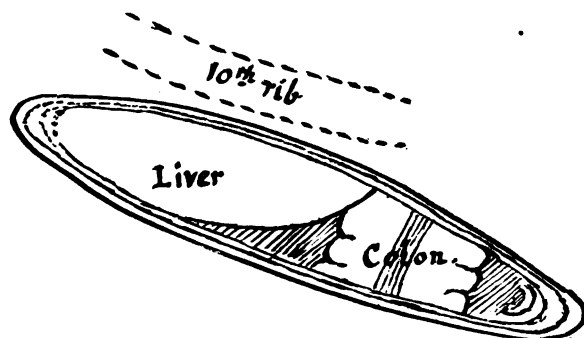
Fig. 2.

happy as to succeed, yet he would have lost much blood before we succeeded, and would thus be less able to stand secondary amputation for gangrene ; and the gangrene in such a patient, and after such an injury, would be sure to appear soon and to spread rapidly. And if we failed to find the source of the hæmorrhage and were forced to proceed to amputation at once, when he had already lost blood during our attempt to find it,

the skin ; the fourth rib was fractured close to its attachment to the spine.

(ii) In the right loin, just below the tenth rib (which was fractured) was a large lacerated wound, opening the abdominal cavity, and exposing the liver and the ascending colon. These organs were not injured. The pleura was torn, air was rushing in and out of it, and emphysema was already beginning to spread over the body (Fig. 2.)

Thus we had to deal with a very serious state of things : a large contused wound opening both the abdomen and the pleura, emphysema, and pneumothorax. But there was no sign that the lung was wounded, or any of the abdominal viscera. I did not give him an anæsthetic, and of course I did not attempt to close either of the wounds ; I only washed them out, packed them lightly with iodoform gauze, and got him back to bed as quickly as possible.

Thanks to good nursing, and to his strength and quiet temperament, he made a good recovery. The upper wound healed rapidly. The liver and colon, exposed in the lower wound, became covered with healthy granulations, and the skin slowly closed over them, forming a small strong scar. There was never at any time any trouble with his wounds ; but for two or three days the pneumothorax and emphysema together gave him great distress. Thus, twelve hours after admission, he was restless and in pain, the emphysema reached up to his eyelids and down to his wrists, his respiration was at one time 70, and he could not lie down. We had to keep him supported with a bed-rest, and to give him plenty of brandy, and hypodermics of strychnine. And on the second day after admission the emphysema began to pass off, the respiration became more quiet, and he got well steadily, and is now ready to leave the hospital.

7. *Fracture of skull in an infant, with pulsation.*—This patient, a baby 10 months old, was admitted on September 12th, having been dropped on its head. On admission it was suffering from intense shock ; but when I saw it next morning, its general condition was very fairly good. Over the right side of the head there was a very large hæmatoma ; and, though it is hard to be sure what one feels through such a swelling, I thought the bone was in one place slightly depressed. Moreover, there was very distinct loss of power in the opposite arm and leg ; they lay still, while the right arm and leg moved vigorously ; and when one pinched or pricked them they moved only a little, and slowly. The pupils were equal and contracted ; the temperature was normal.

Here we had clear evidence in favour of operation ; but I did not operate, because the patient was an infant, and I hoped that it was safer to wait for a time. Next day the loss of power was

certainly no worse, and Mr. Granville reported that in the night free movement of the affected side had been noted. But now there was a fresh symptom, and a very strange one ; the whole swelling over the side of the head pulsated, with a visible expansive pulsation, strong enough to lift one's fingers ; and there was also an impulse when the child cried.

Two days later, the loss of power in the left arm and leg had gone, or nearly gone ; the infant was doing well in every way ; the pulsation could hardly be felt. Next day it had returned ; the arterial impulse was very faint, but there was a strong impulse with crying. This curious sign lasted for several days more ; but the loss of power disappeared within a week of the accident. About ten days after the accident, and again a few days later, the temperature suddenly rose to 103° or 104° ; we found no cause for this. The infant is now in excellent health, save for a small sore, due to pressure, on the back of the head ; no fracture can be felt, and there is no trace of any nerve-trouble.*

8. *Perforation of the Gall-bladder by Gall-stones.*—This patient was only admitted to the hospital two days ago. She was sent here by Dr. Chambers of Goldhawk Road, with acute abdominal symptoms, frequent vomiting, great distension, pain, and collapse ; and there was a small swelling in the right femoral region, which we did not doubt was a hernia.

Seeing the very grave difficulties of all abdominal surgery, we must always be careful to go into the patient's history, to learn every fact that relates to previous attacks, other illnesses, the exact circumstances and onset of the present attack, everything that can in any way dispel the uncertainty of these most anxious cases. With this patient we did not follow this rule ; there was acute abdominal trouble, and there was a femoral hernia, so I operated at once.

Yet if we had gone carefully into the patient's history and into the physical signs of her case, we should have found reason to think the hernia was not the cause of her trouble. For she had been subject to many similar attacks of abdominal pain, sometimes with vomiting ; and in these pre-

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* A good account of these pulsating fractures of the skull in young children is given in Duplay and Réclus' ' Traité de Chirurgie.'

vious attacks she had referred the pain to the region of the liver and the gall-bladder. Of these attacks she had suffered twenty or more. She had not been jaundiced at any time; but it is certain they had arisen in the region of the gall-bladder. Moreover, she was not suffering obstruction; for her bowels had been moved freely just before she was admitted to the hospital.*

Again, if we had made a careful examination before operation, we might have assured ourselves that the case was not one of strangulated hernia. In the first place, there was plainly a great quantity of effused fluid in the flanks; the distension of the abdomen was not uniform. There were no distended coils to be seen beneath the lateral abdominal walls; the abdomen here was smoothly and evenly swollen with fluid. The distended coils were visible only in the central abdominal region; here they lay in an inert mass having somewhat the outline of the pregnant uterus. In the next place, the hernial swelling in the femoral region was neither tense nor tender; it was so slack and soft that it disappeared when the patient drew up her legs, and only appeared again when she put them down.

Careful consideration of the case, then, would have given us these three facts: that the patient had for many years suffered attacks of pain in the gall-bladder; that there was a great quantity of free fluid in the abdominal cavity; and that the hernial swelling had not the ordinary characters of a strangulated hernia.

When I opened the sac in the femoral region, I found it empty. The fluid that ran out of it was bright yellow, and stained the towels yellow; and there was a stricture freely admitting the tip of my finger into the peritoneal cavity. Here was an empty hernial sac, and bile running out of it; therefore she must have a perforated gall-bladder. I made an incision at once over the gall-bladder, and found a large ragged hole in the fundus of it, and the whole bladder packed with very large stones. There was nearly a quart of bile free in the peritoneal cavity. I removed the stones, stitched the gall-bladder in the wound, made an opening far back in the loin for drainage, and also laid a drainage-tube in the hernial sac. In stitching the gall-bladder in the

* But of course there may be a strangulated hernia, even without obstruction.

wound, I was careful to follow Mayo Robson's advice that one should stitch it not to the skin, but to the other layers of the abdominal wall. I laid a large tube in the bladder, and was careful not to prolong the operation, but to get the patient back to bed as quickly as possible.*

I have now gone through the cases of most interest that have been under my care in the hospital during the last three months, and among them I have put every case that ended in death, since these most unhappy cases must above all others be noted and remembered with the greatest care.

The following cases were also shown:
(1) Rodent ulcer of the eyelid after operation.
(2) Very large rodent ulcer of the axilla of six years' duration (for Mr. Eccles).
(3) Tertiary syphilitic disease of the elbow-joint (for Mr. Fraser).
(4) Hernia and hydrocele (for Mr. Eccles).

* The operation was done immediately after her admission to the hospital, on Monday, October 18th. By Wednesday the vomiting had ceased, and the distension had begun to disappear. The bowels acted freely, and by Thursday or Friday the distension had gone altogether, and the abdomen was well drained of the effused bile. But she remained exhausted, and passed into a half-conscious state, refusing her food, and having to be fed with the nasal tube; and she died on Saturday, October 23rd. The *post-mortem* examination showed that nothing had gone wrong with the operation: the gall-bladder was firmly adherent, the stones had all been removed, there was no peritonitis, and the bile had all been drained away, save a little that still lay high up at the back of the peritoneal cavity. There was no fault to be found with what had been done; but she was old and feeble, and could not recover her strength, in spite of the most careful watching and nursing.

The Treatment of Fissures of the Anus with Cocaine and Ichthyol.

—Cheron ('Prakt. Dermatol.,' No. 7) proceeds as follows: The anal fissure is first made insensible by laying upon it, during five minutes, a bit of cotton soaked in a 5 or 10 per cent. solution of cocaine. As soon as the fissure is anæsthetised one or two drops of pure ichthyol are allowed to run into it. This treatment is repeated daily during four or five days, by which time improvement will have progressed so far that dilatation of the anus is easily accomplished, and the fissure may now be treated throughout its whole extent. As a rule, complete healing follows about ten applications.

Medical News, N.Y., Dec. 11th.

A CLINICAL LECTURE

ON

ANEURISM.

Delivered at the Central London Sick Asylum, Cleveland Street, November 25th, 1897,

By RICHARD BARWELL, F.R.C.S.

LADIES AND GENTLEMEN,—Taking my material from what happens to be in the ward, I have chosen a case of aneurism of the arch of the aorta. Before we go to the patient I will mention certain symptoms which will help us to investigate the case with more precision.

Aneurism in that part of the system very often comes on quite insidiously, so that an individual, who at last comes to a doctor and gets his case diagnosed, may have had the disease for a considerable time, and it may have already reached a point at which its treatment is rendered very difficult, and possibly merely palliative. The first that a man feels is a sense of weight and oppression in the chest, which may be very considerable, especially when any extra exertion takes place. The patient may also be conscious of a considerable amount of throbbing, not only in the chest, but also in the neck and up to the head. Very often indeed these are the only signs that the patient complains of, except a feeling of general weakness. When he is examined, the symptoms which attract attention are these:—In a certain part of the chest there is dulness, which is complete in the centre of the area ; that is, the tumour which at first gave rise to no percussion symptoms, has quite gradually increased and is pushing the lung aside, so that there comes against the deep surface of the chest no longer resonant lung, but non-resonant blood. A little further out from this place, where the tumour has no absolute contact with the chest wall, there is a thin but increasing layer of lung over the tumour, so that while in the centre the dulness is absolute, it becomes peripherally less marked. That is generally the first thing that will attract the medical man's attention. But the very position of this dulness, and the peculiar central spot in which the dulness is complete, will warn him that he has not, in all probability, to do with a localised pneumonia. His next discovery will be that there

is pulsation in the same part of the chest and where the heart-beat should not be felt. This pulsation is also different in different parts of its area, namely, in its centre it is most forcible, depending on how near the aneurism has come to the chest wall, and it gradually fades off into the circumference. In certain cases pulsation can be felt early on and above the clavicle, either to the right or to the left, and in the episternal notch, or it may be that in all those places it is perceptible pretty early in the case. After a time, and when the aneurism begins to press strongly upon the chest wall, it causes that wall to bulge forward. At first that is a mere even enlargement or forward protrusion of the chest, but afterwards, and in the later phases of the case, it is a blunt conical swelling, very much of the shape of an abscess that is about to point. There are also certain other symptoms, such as changes in the pulse, difficulties in breathing and cough, which shall be considered immediately. We will now see the patient and demonstrate his symptoms. You find that on the manubrium and half an inch to its left dulness is complete ; this mingles with the heart dulness as we trace it down. On either side of this area dulness is relative only, and still further out percussion renders a clear note. As to the pulsation, a good way of verifying it is to place the fingers of the hand lightly on the area, and notice how they are jerked up, and which of them the most ; by this means you will see at what part the pulsation is greatest. Another method of seeing the pulsation is to place a stethoscope upright on the area and notice how the top of it "twigs" or oscillates. The pulsation is in this case most strong at the left sterno-clavicular joint, and thence in the downward direction diminishes. There is in this phase of his disease no very evident tumour, but there is a bruit,—that is to say, an abnormal sound—a distinct bellows murmur—arising from the blood in the tumour being disturbed in its flow. But the valves of this man's heart are not quite perfect ; part of the bruit we hear is certainly cardiac. Even in this case, though not so plainly as when the valves are healthy, you may detect the characteristic aneurismal sound. You hear the first sound echoed in the aneurism like a whir, or like water running strongly through a sluice ; but when the mass of the blood in the aneurism goes back at the systole of the heart, it

being so large in bulk shuts the valves with a noise which I may compare to slamming a door instead of shutting it properly. These are what I have called direct symptoms, but however important in the diagnosis of aneurism, they do not indicate much more than the existence of such disease, and till of late years this was thought to be quite sufficient. When once the surgeon or physician had made out the presence of an aneurism he thought he had done his work. But a number of years ago some cases occurred to the late Dr. Cockle, in which he found consolidated aneurisms and also the left carotid was occluded, evidently before the aneurism began to consolidate. He wrote some papers upon the subject, and threw out the idea that in certain aortic aneurisms the left carotid might advantageously be tied. Since that time much pains have been taken to determine which aneurisms might be so treated with advantage, and those in which such treatment would prove futile. I am not going into that subject just now, but I merely mention it to show you why it is desirable to make out from what part of that short tube which constitutes the arch of the aorta an aneurism originates. That must be diagnosed from such symptoms as I shall now mention, and which we distinguish as indirect. One of these is a change in the pulsation of different arteries of the head, neck, and upper limbs. The others concern the neighbouring parts upon which that aneurism may press.

We will take first the changes in the pulses. You will readily understand that if there is an aneurism on the root of the vessel, so as to form a sort of funnel for the blood to run through, you are likely to get more blood to run into that vessel than there should be, therefore the pulse on the one side will be enlarged ; while such a funnel diverting from the aorta into one vessel more blood than is its due will leave less than the proper quantity for other arteries. In most anatomical books the arch of the aorta is, as a rule, drawn quite wrong with regard to the way the first three vessels spring from it; they are generally drawn straight and at right angles to the main trunk, they really arise obliquely and are curved ; also they originate very close together, so that there is scarcely any district of the aorta itself between the innominate and left carotid, nor between the latter and left subclavian. Moreover there are certain other peculiar points which I investigated several years ago, and I was able to show that from the origin of each of these vessels spurs or ridges are prolonged on the inner surface of the aorta, so arranged as to divert its share of the current into its own lumen. Now, if you feel the two radial pulses of this man you will find the left bigger than the right,—that is, it occupies a wider space on the wrist. Such differences are more easily felt in the radial than in the carotid; nevertheless in this particular case you will find the difference in size between left and right carotid even greater than that between the two radials. Such a vessel does not carry such a surplusage of blood as its size might lead us to imagine. The blood which flows through a funnel, such as an aneurism, into the vessel comes in a more even stream, especially if the tumour be situated so as to involve the root of the vessel at the aorta ; and for this reason, that the greater amount of blood there forms a sort of lake, which, pulsating over a larger space, eliminates from the current beyond some of the pulsatile force. You know that in a fire-engine the water would come out in jerks if it were not for the contrivance I am about to mention, namely, the water is first pumped into an iron vessel leading from the tube, and then from the iron vessel it goes out into the pipe. At the top of the vessel there is some air, which acts as a spring, so that it obviates the necessity for the throb or pulsation of the fluid beyond. In an aneurism there is no air, but the elastic walls assume the spring-like action. Therefore it frequently happens that the pulse will be weaker and softer, even though the vessel is large, because it is never as empty as it should be, and never quite full.

We now come to what are described as pressure symptoms. One of these is dyspnœa, which is often a very distressing symptom, and may be the cause of death. The patient may absolutely be suffocated without any rupture of the artery. The dyspnœa may be of two very different sorts, not difficult to distinguish, but both due to pressure. The first sort is due to pressure either on the bronchus or on the lower end of the trachea, the second comes from interference with irritation of or pressure upon the recurrent laryngeal nerve. Now pressure upon a bronchus or upon the trachea is easily distinguished, because respiratory sounds

are so altered. Instead of an ordinary murmur you have a loud, harsh,· almost metallic, sawing noise; sometimes it approaches an organ-pipe note. At first this is only noticed on inspiration, but after a time expiratory murmur also begins to participate, but is hardly ever as violent as on inspiration. When the pressure is only upon one bronchus the sound is very much louder in one lung than in the other. But it is very rarely confined to one lung; the other is also affected, because the current of air carries the sound back, and the current itself is interfered with and embarrassed before it comes to the actual obstruction. When both sides are equally noisy the pressure is on the lower end of the trachea, very often just at the bifurcation. This noise is continuous. But the patient will also probably be troubled with paroxysms of cough, which sometimes are extremely distressing and harassing until a little plug of mucus is got rid of, and as soon as he has recovered from the fatigue he is more easy until another outburst. But with all this the voice is not weaker; sometimes it is very loud, and has a hard, brassy sound. These symptoms will clearly show that the dyspnœa arises from pressure on some part of the air-tube. The other, which is caused by interference with the recurrent laryngeal nerve, is first of all manifested by a change in the voice, which, instead of getting harsh and brassy, becomes weak and toneless; there is a peculiar lack of *timbre*, which one soon learns to identify. Dyspnœa very early in the case is paroxysmal. Sometimes the patient is quite free, and then he has an attack very closely resembling laryngismus stridulus in children; there is the same crowing attempt at inspiration, the same struggle, and the same difficulty. Indeed, tracheotomy has been more than once performed for the condition, sometimes admittedly by mistake, but it is a mistake which has given to the patient greater comfort. Later there is no difficulty of this sort, but the voice becomes more and more extinct, until complete aphonia comes on, so that one has to place one's ear close to the patient's mouth to hear anything at all. When the aphonia gets nearly complete the patient has a great tendency to choke at meals,—is very apt to " swallow things the wrong way," as it is called. This is due to the pressure upon the recurrent laryngeal rve having paralysed one or both vocal cords,

it or they hang loose, no longer closing the glottis against the entrance of food. Later in the case there is dysphagia (difficulty in swallowing), produced by pressure upon the œsophagus. If, when this dysphagia is first coming on you give the patient some water, and get him to swallow a little, you will be able to detect dysphagia long before the patient himself is aware of it. By applying the stethoscope a little to the left of the first dorsal vertebra, while the patient is swallowing the teaspoonful of water you will hear the gurgling effort at deglutition frequently double, treble, or (as I have heard it) seven times before the act is completed and the parts come to rest again.

Another symptom is irregularity of the pupils, either dilatation or contraction from irritation, afterwards impeded function of the sympathetic. Displacement of the heart downward and to the left, and certain pains deep in and at the back of the chest, afford valuable though somewhat negative data for diagnosis.

Some of the most important symptoms are produced by pressure on the veins, causing congestion of different parts, often a doughy lump over one or both clavicles, and œdema about the face and arms. The significance of the localities of congestion depends in great measure upon their relation to other pressure symptoms. Certain combinations furnish remarkably positive evidence. For instance, pressure wholly and entirely on the right bronchus; congestion of both arms and both sides of the head and chest; tumour symptoms, chiefly about the second space and rib, considerably to the right of the sternum; heart displacement, if any, directly outward; the pulses equal, with very slight sphygmographic change— perhaps a rather sloping upstroke, usually a flat blunt apex; absence, partial or total, of dicrotic wave, but undulatory character of whole down line, —indicate disease of the ascending aorta. Congestion of the left arm, supra-clavicular region, and side of the head; aneurismal character of right pulse (radial and carotid); tumour symptoms a little to the right of the sternum, and probably some tracheal dyspnœa, are symptomatic of aorta-innominate aneurism. Modification of left radial pulse; affection of left vocal cord; left venous congestion; tracheal dyspnœa, and obstruction of air to both lungs, with tumour symptoms on and

to the left of the median line, mark disease of the transverse aorta. Obstruction to the entrance of air to the left lung alone, with pains at the back and along the intercostals, is indicative of disease of the third part of the arch. It is unnecessary to multiply these examples, which must be taken as indicating simply the broader lines of diagnosis.

I could wish to tell you that the medicinal treatment of aortic aneurism were more successful than it is; there is no drug that will rehabilitate an injured aorta, and often it happens that we can but treat by calmants and other such means the symptoms just described. Low diet and bleeding (Valsalva), dry diet (Joliffe Tufnell), iodide of potassium (Chuckerbutty) may be tried, and in some cases a certain good has occasionally resulted either from the method or its accompaniment, viz. rest. If we take a man from hard work or injudicious sporting, from the public-house or a too copious table, restrict his eating and especially his drinking within quite moderate limits, and force upon him repose in bed, we shall in all probability find that with the quieting down of the heart and vessels the aneurism will also somewhat empty itself and throb less. In some cases the benefit of such quietude may continue if the patient on getting up be prudent; but in the majority of cases the improvement produced by complete rest lasts only a day or two beyond the cessation of the treatment. I may warn you, too, that when either dyspnœa or cough is severe there is no possibility of rest; the part which most wants repose is the chest, and this is the part which those two symptoms overwork. Again and again have I seen patients kept in bed, undergoing what is fondly supposed to be treatment by rest, while the labour thrown upon the thorax was tremendous. When these conditions supervene it is full time to consider other treatment. Many years ago Dr. Cockle, guided by some pathological specimens, proposed for certain cases ligature of the left carotid. Shortly afterwards I had a patient, the locality of whose aneurism seemed to me to indicate a different procedure. I tied the right subclavian and carotid with success, and afterwards had several cases, all greatly benefited. Mr. Moore's treatment by wire has, as such, failed. So also has that by electricity by means of needles passed into the tumour. I hate to have to speak so much of myself, but must claim as mine, years before any one else tried

it, the idea of introducing from two to four feet of burnished steel wire, and passing along it a gentle current of electricity. The result was promising.

Recently another plan has been tried which I have found advantageous, not probably in curing, but at all events in retarding the growth of aneurism and relieving some of the distressing pressure symptoms. In a conversation about aneurism with Dr. Bezly Thorne, he told me that, in the belief that what relieved hypertrophy of the heart might relieve aneurism, he had used Dr. Schott's method in such a case with much advantage. You know that that gentleman, after studying the procedure at Nauheim, introduced it into England, and it has profoundly modified the treatment and the prognosis of heart disease. The object of the exercises, also of the baths, is by facilitating capillary circulation to diminish resistance to the heart's efforts at propelling the blood. Now carry this idea into the condition of an aortic aneurism, into which the heart is pumping blood at the rate of seventy-five or eighty strokes a minute. The stronger the resistance to the onflow of fluid beyond the aneurism, the more force is exerted on the walls of the sac; but open the sluice, i. e. expand the capillaries, let the blood flow on beyond unresisted and unimpeded, then you will have a commensurably low pressure on the walls of the aneurism. I cannot at present enter into the clinical results of cases which I am now subjecting to this method, regularly but cautiously carried out; the results are, however, up to the moment of speaking, so encouraging that I shall certainly use the method in early cases, and also in certain forms of more advanced ones.

But I see that I have overstepped my time, and, though I might add a good deal about treatment, find that my remarks must close.

NOTES.

The Comparative Value of the Principal Methods of Treatment of Hæmorrhage due to Abnormal Insertion of the Placenta.—The double end that the physician proposes to attain in case of hæmorrhage due to an abnormal insertion of the placenta is to arrest the flow of blood, and to hasten the expulsion of the fœtus.

Vaginal tamponade before the era of antisepsis

gave very bad results. Thus King gave a statistic of eighty-five cases in which the tamponade was used with nineteen deaths, in other words a mortality of 22 per cent., and Muller gives 21 per cent. as the maternal mortality out of 161 cases. The intervention was the principal cause of death.

Nevertheless, early statistics furnish very useful data in appreciating the usefulness of a tamponade, both as a means of producing hæmostasis as well as a means of inducing labour. Of 128 cases mentioned by Muller, sixteen times a tamponade was useless, while seventy-eight times uterine contraction occurred, as follows:

Within one hour	2 cases.	
Within from one to five hours ...	22 ,,	
Within from six to twelve hours	28 ,,	
Within from twelve to twenty-four hours	9 ,,	
Within from twenty-four to forty-eight hours	6 ,,	
Within three days	5 ,,	
Within four days	2 ,,	

And one case at the end of a week.

Tamponing, according to the opinion of Juge, is useless in controlling hæmorrhage or incapable of starting up labour in nearly half of the cases so treated. By collecting the different statistics published in recent years, the same writer finds a maternal mortality of 26·8 per cent., and a fœtal mortality of 77·6 per cent.

Bipolar version of Braxton Hicks, which obtained rapid success in both England and Germany, gives a fœtal mortality of 78 per cent., and a maternal mortality of 6 per cent.

Simple and free rupture of the membranes, whether the presentation has become engaged or not, has given Professor Pinard of Paris sixty-three complete successes out of sixty-six cases.

At the Baudelocque clinic, out of seventy-three cases of intervention for hæmorrhage due to a bad insertion of the placenta, occurring during the years 1890 to 1895, forty-five times the rupture of the membranes was alone necessary, and gave forty-five successful results in hæmorrhage; nineteen times it was found necessary to use Champetier's bag because either the hæmorrhage had to be controlled or dilatation had to be more rapidly completed. The final results have been for this statistic 2·74 per cent. for the maternal mortality, and 37 per cent. for the fœtus.

Champetier's bag was sometimes placed outside of the ovum, that is to say, between the envelopes of the latter and the wall of the uterus. The results in this case were only of secondary value, but this manœuvre, nevertheless, is a principal means for provoking a rapid dilatation of the cervix, and in those very unlikely cases in which the membranes were found inaccessible, and were pushed up in front of the instrument for perforating the membrane, the former means may be used for want of something better. When Champetier's bag is introduced into the interior of the amniotic cavity after the membranes have been freely ruptured, excellent results have been obtained, and its hæmostatic action is both constant and certain. It also dilates the cervix rapidly, and allows the physician to end the labour in a very short lapse of time.

Rupture of the membranes combined with the introduction of Champetier's bag into the ovum is certainly superior in every respect to tamponing, according to Juge.—EDITORIAL, *Annals of Gynecology and Pediatry*, December, 1897.

Momentary Insanity from the Use of Sulphate of Atropia used in the Eye.—In 1894 a white man came to me from Missouri to be operated on for cataract. I used a weak solution of sulphate of atropia in the eye three times before the operation, to see if there were any adhesions of the iris, and in a few hours after its use the patient lost his mind. I thought it due to the dread of the operation, and when he was better I sent him home. However, he recovered in a short time.

In 1896 a coloured woman came for the same operation, and I used the atropia as I did in the other case, and she, too, lost her mind; but when she came out from under the influence of the atropia her mind was clear. Believing the medicine to be the cause, I used it again, and it had the same effect as before. And as she was in good health, and did not dread the operation, I knew the atropia caused the insanity.

These are the only cases that I have had in my practice, and have never seen or heard of any reported before. The cause of the insanity was, no doubt, due to idiosyncrasy.— Dr. A. H. EDWARDS, *The American Practitioner and News*, November 27th, 1897.

CONTENTS.

* Specially reported for The Clinical Journal. Revised by the Author.

A CLINICAL LECTURE

ON

SOME POINTS IN CONNECTION WITH THE CAUSES AND TREATMENT OF HÆMOPTYSIS.

Delivered at the Hospital for Consumption and Diseases of the Chest, Brompton, November 17th, 1897,

By C. Y. BISS, M.A., M.D.(Cantab.), F.R.C.P.,

Physician to the Hospital; Physician to Out-patients and Lecturer on Therapeutics, Middlesex Hospital.

GENTLEMEN,—Hæmoptysis is a matter of such practical importance that I need say nothing to justify its selection as the subject for our consideration to-day; although for obvious reasons it is incapable of illustration by the demonstration of clinical cases in the manner usual here. Neither can I hope to attract your interest by bringing forward anything of novel or original character in connection with a subject already so well worked out. I can only strive to illustrate from experience some points in connection with the nature and causation of this affection, and its treatment. I do not propose, nor indeed would it be possible within the short limits of the time available, to speak of the subject in a complete or systematic manner, but I hope to deal with certain matters which from their clinical importance are likely to be practically useful.

A case of hæmoptysis may come before us in two ways : we may be called to treat a patient who is obviously bringing up blood from his lungs, and where there is no difficulty in determining the fact; but, on the other hand, we may have to deal with cases in which there is only a history of " bringing up blood," and where it may be difficult to decide whether the blood really came up from the chest or not. All who have had any experience of practice know that such cases do frequently arise. My first effort shall be to suggest a few considerations which may guide us in determining the real nature of the bleeding.

The hæmoptysis, for example, may be a spitting of blood which does not come from the lungs, though it may have seemed to do so,—a case, in fact, of pseudo-hæmoptysis. In such cases, which are fairly common, there may be only bleeding of the gums, or from the nose or pharynx. If the blood is small in quantity, non-aërated, and mixed with saliva, or if the bleeding alternates with epistaxis, its nature is usually easily determined. The patients are often young persons, sometimes hysterical women, who suck or lacerate their gums or palates, or who have spongy gums, or bleeding points in the neighbourhood of carious teeth, from which a little blood may ooze into the mouth and be apparently expectorated. Such cases may, but do not usually, present much difficulty. A few years back I had a young woman under my care in this hospital, who spat up from time to time, or at least appeared to do so, varying quantities of blood diluted with saliva. She was thin and wasted, and had an occasional rise of temperature, but presented no auscultatory signs whatever of chest disease. By careful observation it was soon ascertained that the sputum, if it may be called sputum, was really only saliva mixed with blood, and that it only appeared after she had been left alone for a time. Moreover, no rise of temperature occurred except when she had been left alone—never when the nurse remained by her bed after placing the thermometer in the

axilla or mouth. How she contrived to raise her temperature was difficult to determine, but she could always do so if left alone with the thermometer. After this had been detected the blood-spitting ceased, and the temperature remained normal. I have also known a case in which a young person brought up blood, but in no great quantity, in which the true character of the bleeding was determined by the occurrence of an attack of epistaxis. In this case, however, some of the blood was also vomited, having probably been swallowed during sleep.

In deciding whether a case of hæmoptysis reported to us has really been of that character, there are certain well-known points, such as the colour, consistence, and quantity of the blood, and the way in which it came up, which may render diagnosis easy; but yet there are cases in which it is extremely difficult, if not impossible, to decide from the history alone whether hæmoptysis has really occurred. A simple rule which I have found very useful is to make out whether after the hæmoptysis occurred there was any continuance of cough, and whether during the first few hours after the occurrence of the hæmorrhage small quantities of blood, or of blood-tinged mucus, were coughed up. When hæmorrhage has occurred in the lung, blood is rarely brought up on *one* occasion only; the probability is that at least small quantities will be brought up at intervals for some hours afterwards. Where no cough follows the original hæmorrhage, and blood is brought up once, and once only, though profusely, the case may be suspected to have been one of hæmatemesis. It may be perhaps worth while to remark that many people, especially those of the lower classes, use very indefinite expressions to describe the matter, and will speak of blood having been " vomited up " without in the least meaning that the blood came from the stomach, which this expression properly imports. This is hardly to be wondered at if it is borne in mind that persons always get excited when they see blood issuing from the mouth, and that the faintness which is often felt at such times prevents clear thought, and is often accompanied by a sensation of nausea, which suggests to them that the stomach is the source of the bleeding. Every history of blood-spitting requires careful analysis.

Nothing is more common than for persons who have brought up blood from the chest to suppose that it came from the throat; and, indeed, they often say that their medical attendant has told them so. I must say, however, that I think hæmorrhage from the throat, even in small quantities, is an exceedingly rare event. It is, of course, conceivable that patients suffering from chronic pharyngitis accompanied by a varicose condition of the pharyngeal veins, or ulcerative conditions of the pharynx or larynx, may spit up a little blood which has come from those parts, but I have seen very few cases indeed in which this could be determined with any certainty; indeed, I can only recall two—one a case of syphilitic ulceration of the larynx, the other a case of chronic pharyngeal inflammation in which the mucous membrane of the pharynx was swollen, congested, and velvety. In both of these cases the blood could be seen exuding from the affected parts, but the hæmorrhage was very slight. I think, therefore, that the safest rule is to exclude the upper part of the respiratory tract as the source of the bleeding unless it can be positively seen to issue from those parts. I think *copious* hæmorrhage from such causes, if indeed it ever occurs, must be a very exceptional event indeed. True bronchial hæmorrhage in any quantity is also comparatively rare. I believe it may occur when there is syphilitic ulceration of the bronchi, or in certain cases of bronchiectasis, where the mucous membrane lining the dilated bronchi is hyperæmic, or is undergoing necrosis. Excluding these, and also cases of pneumonia, new growths, gummata, also parasitic affections such as hydatids of the lung, the bursting of aortic aneurysms into the lung, and pulmonary abscess or gangrene, in all of which the diagnosis can usually be made without any great difficulty by the specific physical signs of these conditions, we come to the consideration of bleeding from affections of the pulmonary tissue itself, which furnish by far the largest number of the cases in which hæmoptysis occurs; and these may be grouped under three headings : first, hæmorrhage depending upon tubercular disease of the lung ; second, hæmorrhage depending upon cardiac disease ; and thirdly, hæmorrhage depending upon specific blood conditions, or certain conditions of the pulmonary vessels probably of a congenital character, each of which we may now proceed to consider separately.

1. *Hæmorrhage depending upon Tubercular Disease of the Lung.*

When the pulmonary tissue is invaded by tubercular formation, more or less hyperæmia takes place in the neighbourhood of the affected areas. Such congestion may certainly exist without hæmoptysis occurring, but it is probable that those cases of early pulmonary tuberculosis in which hæmoptysis in small quantity takes place from time to time, are of this nature, the blood being derived from capillary oozing into the lung. As, however, the disease advances, and the pulmonary tissue becomes infiltrated by tubercular growth, the lesions undergoing softening and necrosis, these changes often cause pulmonary hæmorrhage, although not of any considerable extent unless a vessel of some size is eroded or divided. Fortunately, as is well known, the rule is for vessels involved in tracts of tubercular infiltration, or which run through areas which are undergoing necrosis, to become thrombosed, obliterated, and gradually metamorphosed into mere cords of fibrous tissue; and but for this, profuse hæmorrhage would be much more common than it is. Oozing of blood sometimes takes place into cavities the walls of which are spongy and hyperæmic; and if a vessel is laid open by tubercular growth before its lumen has become occluded by the formation of a thrombus, severe hæmorrhage may result. The most common cause, however, of copious hæmorrhages, especially in the later stages of tubercular disease, is the formation of small aneurysms of branches of the pulmonary artery, the walls of which become thinned and give way. Such aneurysms are frequently multiple, and may be very numerous. Excellent examples are seen in the museum specimens placed before you. They may occur under two very opposite conditions: first in cases where, during the earlier stages of tubercular disease, the deposit may undergo rapid softening and removal, and a branch of the pulmonary artery be laid bare at one side and deprived of the support afforded to it by the lung tissue, so that it bulges outwards and may burst before it is filled by the formation of a thrombus. But, in the second place, and certainly most frequently, such aneurysms are found in cases of chronic disease, where cavities have formed, in whose walls vessels may run which remain pervious, and whose walls may become dilated

and thinned on the side of the cavity, and eventually burst at some point of the dilated portion. Such aneurysms frequently fill the small cavities into which they have projected: their size varies from a pea to that of a small walnut. The hæmorrhage which follows their bursting is generally, though not invariably, fatal; and the profuse hæmorrhages which occur in consumptive patients during the later stages of the disease, and which so often prove fatal, are generally due to this cause.

This brief outline of the pathological causes of hæmorrhage in connection with tubercular disease of the lungs, is probably both too short and too long—too short to be a complete account of the matter, yet too long to be consistent with that conciseness at which this lecture aims; but leaving this part of the subject, I go on to consider—

2. *Hæmoptysis resulting from Cardiac Disease.*

In entering upon this topic I am tempted to say a word about the relative frequency of hæmoptysis from this cause compared with that which is due to lung disease. Although hæmoptysis from cardiac disease is common, I cannot but think that it is much less common than that due to pulmonary disease; and I confess I have often read with surprise Trousseau's remark * that "hæmoptysis symptomatic of tubercular phthisis is not perhaps the hæmoptysis most frequently met with; the most common kind is that dependent upon disease of the heart;" for although he explains that this remark must not be taken to imply that tubercular hæmoptysis is absolutely less common than hæmoptysis arising from cardiac disease, and that tubercular patients, owing to their attacks of hæmoptysis being transient, and taking place in the early stages of their disease, do not as a rule go into hospital, while hæmoptysis dependent upon cardiac lesions generally occurs when the disease is far advanced, and consequently at a time when the sufferers are obliged to seek relief. I cannot say that this concurs with my own experience of hospital practice. I should rather have thought that as nothing more readily brings people to our doors than an attack of spitting of blood, however slight, a fair comparison might be made without

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* 'Clinical Medicine,' vol. iii, p. 144, Sydenham Society's edition.

drawing this distinction ; and that we might con- clude that the frequency of hæmoptysis reasonably attributable to pulmonary disease was far greater than of that due to diseases of the heart.

The causes of hæmoptysis in cardiac disease are mainly two : first, hyperæmia of the lungs due to stenosis or incompetence of the mitral valve, the former being the more common case ; or inability of the dilated right ventricle to drive the blood at the normal rate through the lungs onward to the left side of the heart. Any con- dition of cardiac disease which induces dilatation, even, for example, the dilated heart of renal disease, may lead to congestion of the lungs and consequent hæmoptysis. The second cause is the formation of thrombi in the right side of the heart, in conditions of feeble or impeded circulation, which pass into the pulmonary circulation and lodge in various situations in the lungs. Around these infarcts hyperæmic areas form and tend to bleed. Moreover, thrombi may form in the pulmonary vessels themselves in cases of long-continued congestion from any cause, more especially, per- haps, in gouty subjects, and a congestive hæmoptysis be thus produced. I think that blood-spitting from cardiac causes is more frequently scanty than profuse ; at any rate, it is less commonly copious than in pulmonary disease, or when due to certain causes yet to be mentioned.

3. *Hæmoptysis resulting from certain Morbid Con- ditions of the Blood, or of the Blood-vessels.*

The third class of cases includes those in which hæmoptysis depends upon certain specific conditions of the blood, or of the smaller pulmonary vessels, or perhaps the concurrence of both these states, in persons in whom congenital tendencies to hæmophilia and allied conditions exist. This class probably embraces a larger number of in- stances, and furnishes cases of greater severity and importance, than is generally supposed. It is, of course, a matter of general knowledge that in purpura, scurvy, toxæmic states (among which, perhaps, gout may be included), leuchæmia, hæmo- philia, and other conditions of disease in which congenital or induced changes in the blood and vessels are known to occur, hæmoptysis may take place. Such hæmoptysis, too, may be profuse, and even fatal. The point, however, to which I wish to call special attention, is not the occurrence

of hæmoptysis under any of these well-known conditions, but in a class of cases of a much more common type, namely, those in which a large hæmoptysis may take place in a young, middle- aged, or even an elderly person, who has given no previous sign of tubercular disease of the lungs, nor of any other condition in which such hæmor- rhage is known to occur, and who may not subse- quently become the subject of tubercular disease. Such cases are known to all, and are, I should apprehend, generally considered to be dependent upon an antecedent tubercular affection. But while fully admitting that tubercular disease may exist in the lungs without giving rise to physical signs, I have always found a difficulty in believing that, in such cases, the previous formation of tubercles had necessarily taken place. It is quite true that some of these patients subsequently become tubercular, but others do not ; and while something may be said in favour of the supposition that in these cases tuberculisation may have pre- ceded and caused the hæmorrhage, it must be admitted that this is far from proved. The ques- tion, therefore, arises whether there is here some common cause for the hæmorrhage and for the subsequent development of tubercle where the latter occurs, such as, for instance, a delicacy of the lung tissues, or of their vessels, that is, a feeble capacity of resistance to tubercular invasion, com- bined with a tendency to bleed more readily than stronger lungs would. Such feebleness may be sup- posed to be hereditary and congenital. Phthisical inheritance is not the inheritance of the disease, but of a tendency to acquire the disease under suitable circumstances. Delicate lungs which are prone to bleed more readily than others, may not unreason- ably be supposed to be equally delicate as to their power of resistance to tubercular invasion. I once saw an old gentleman who stated that he had, when a young man, brought up a large quantity of blood on three separate occasions, and that he had been sent to the Cape as hopelessly consumptive, yet he had never manifested any of the ordinary symptoms of that disease, and was, when I saw him, enjoying a hale and hearty old age. Apparently there is some connection in these cases of pulmonary hæmorrhage (many of which follow and appear to depend upon mechanical strains, such as running, lifting, dancing, &c.), between the tendency to hæmorrhage and the

tendency to become tubercular; but I think it is not unreasonable to consider that this tendency to bleed from the lungs may be only an evidence of their congenital delicacy, and therefore of their special aptitude to succumb, under appropriate conditions, to the inroads of the *bacillus tuberculosis*. In other words, such patients have, and probably have inherited, lungs of a poor quality, whose vital powers are deficient, and which, probably from a congenital delicacy of their blood-vessels comparable to that which exists in hæmophilic people, are more prone to hæmorrhage than those of other persons. I think there is a certain advantage in viewing the subject in this light. By doing so we see that it is not necessary to suppose that all such subjects of hæmorrhage are at the time of bleeding necessarily tubercular; and if we regard the hæmorrhage as a forewarning of pulmonary delicacy, we can handle each case with the caution it requires, and endeavour by climatic and other precautions to guard our patients against subsequently incurring tubercular infection. I am not minimising the gravity of pulmonary hæmorrhage as the herald of tubercular disease. I believe it is a most grave forewarning of that disease, although I cannot help thinking that in many cases it is not due to the actual incidence of tuberculosis itself.

The Treatment of Hæmoptysis.

There are few points upon which more difference of opinion has existed than the treatment of hæmoptysis; but while acknowledging the difficulties of the subject, I cannot help deprecating the pessimistic aspect assumed by some in this matter. It is perfectly true, as they say, that there are cases of hæmoptysis that will get well without the physician, and cases of hæmoptysis for which the physician can do nothing, but is there not also a third class of cases in which skilful treatment may save a life which would be lost without it? I believe that this is the case; and that we should respond to the confidence which our patients repose in us by bringing the best science and skill we can to their relief, believing that while injudicious treatment probably makes some cases worse, judicious treatment frequently does great good. There is great force in a remark I once heard from the lips of an eminent physician of great experience, that the first requisite in the treatment

of hæmoptysis is to have some definite idea of what one proposes to do in each case, and how one proposes to do it. Our remedies may be simple, but at least let us clearly conceive what we expect to accomplish by their means, and what will be the method of their operation.

1. *Moral management.*—In the treatment of pulmonary hæmorrhage some stress must be laid in the first place upon the moral management of the patient. The alarm he naturally feels should be relieved by the assurance—if it can be truthfully made, as in most cases it can—that the hæmoptysis is not likely to prove fatal. He should be enjoined to be restful and quiet, and care should be taken to avoid the injudicious fussing of relatives and others around the bed.

2. *Position and rest.*—Should the patient be found lying upon a bed or couch, it ought to be carefully considered whether it be wiser to move him or to leave him undisturbed; but I think in any case the effort should be made to loosen, and if possible to remove, all tight clothing, not by taking the clothes off, which would be extremely injudicious, but by loosening or cutting them open as far as may be possible without unduly disturbing the patient. The examination of the chest by percussion and auscultation should be avoided, except so far as listening to the breathing over the front of the chest, for the site of the hæmorrhage may frequently be determined in this way. I need not say that the sensations of the patient are not a safe guide, and must be regarded with caution. The importance of ascertaining the source of the hæmorrhage, where this is possible, is great, for over that spot we should apply the ice-bag if we decide to use it; and in some cases when a patient has bled profusely into one lung, and is half suffocated in consequence, an appropriate change of position may enable him to cough up the blood which has collected, and avert impending asphyxiation.

3. *Local applications.*—Opinions are divided as to the advisability of applying ice to the chest: some think that it does no good, others think that it tends to induce catarrh. I confess I am of the number of those who believe that in many cases this is a valuable method of treatment, and ought unhesitatingly to be adopted. I have not seen it produce catarrh, and I have many times seen it do at least apparent good. Moreover—and this is a

point of some importance—the feeling that a means of treatment which appeals strongly to his senses is being employed for the arrest of the hæmorrhage, has a soothing effect upon the patient's mind. The same remark applies to dry cupping, but I conceive that this is not altogether unobjectionable on account of the physical disturbance which it is apt to produce, and I do not recommend it.

4. *Relief of cough.*—Whether the cough ought or ought not to be relieved in any given case of hæmoptysis is a question which must be decided at the bedside. Unless the cough is severe it does not need treatment; on the other hand, if it is necessary for the purpose of clearing the lungs of blood, it is a great question whether good would be done by checking it. There is, however, an intermediate class of cases in which it is most desirable to reduce the frequency and severity of the cough, and in these cases I think a hypodermic injection of morphia is to be preferred to any other means.

5. *Treatment addressed to the nervous system.*—Patients spitting blood, especially soon after they have begun to spit blood, and if in large quantity, are frequently restless and alarmed; sometimes, on the contrary, they are passive and half collapsed. In cases of nervous excitement I think the employment of opium in some form is most desirable, for in no other way can we so effectively secure that quiescence of body and mind which is necessary to the well-being of the patient.

6. *The action of the bowels.*—In hæmoptysis it is generally, not to say invariably, advisable that the bowels should be opened as soon as possible, and be kept freely opened; for as the abdominal circulation is capable of containing a large part of the total amount of blood, it is not unreasonable to believe that the induction of brisk bowel-action by means of purgatives will cause a large amount of blood to pass into the intestinal vessels, and that this may tend to reduce the tension of the circulation elsewhere. I cannot help laying stress upon this point, not only on account of its intrinsic importance, but because I have frequently found in cases of hæmoptysis that patients have been treated without any regard to these considerations, the bowels having been kept confined by the administration of astringents and opium, sometimes without design, and sometimes

from a belief that the patient is in a more favorable position if spared the exertion of defæcation. This need not be feared, however, if the patient is properly nursed. It is unnecessary to say that he should not leave the recumbent posture, and that the use of the bed-pan should be enjoined. I do not recommend the administration of enemata if they can be avoided, for many persons become excited and disturbed under their use, and the restlessness · induced by the application of a remedy to which an objection is felt might induce further bleeding. Probably nothing is better than the immediate administration of five grains of calomel, followed by a saline purgative at an appropriate interval : after which free action of the bowels may be maintained by adding to the mixture to be given some sulphate of magnesia along with a carminative, such as syrup of ginger, in sufficient quantity to produce two or three watery stools daily.

7. *Other medicinal remedies.*—I fear that our knowledge as to the exact pharmacological action of most of those remedies which are in repute as remote astringents is very imperfect, and even in some cases contradictory; and for this reason it is doubtful whether there is any advantage in the administration of certain drugs which in days gone by have been held in regard as internal styptics. Among these may be named gallic acid and ergot, the former of which is objectionable on account of its tendency to constipate the bowels; and as to the latter of which there is some reason to believe, gathered from recent researches, that while it contracts the smaller systemic arteries it has no effect upon those of the lungs, and that it may indirectly tend rather to raise the tension of the pulmonary circulation. There is very little evidence to show that hamamelis, dilute sulphuric acid, and other astringents of this class, have any definite effect upon the small vessels of the lung. More, perhaps, may be said for turpentine, the action of which in the hæmorrhage of purpura and scurvy is recognised to be of great value. In many cases I lean to its employment conjoined with sulphate of magnesia, and sometimes opium also; and the objects aimed at by the use of each of these drugs have been explained above.

8. *Diet.*—The first point to be touched under this head is one which I believe to be of cardinal importance, namely, the privation of fluid. It

seems reasonable to believe that the best way to check bleeding in the lung, in all cases in which bleeding can be checked, is by encouraging the formation of thrombi at the site of the bleeding; and that the lower the tension of the circulation, and the less fluid the blood is, the more likely is this to occur. For this reason I have often thought, but I am sorry to say I have never yet put it to the practical test of experience, that iodide of potassium,* which is known to have a remarkable power of increasing the tendency of the blood to clot, might be an advisable drug to administer in the treatment of hæmoptysis. But whether this be so or not, surely the fluidity of the blood can be reduced by lessening the amount of liquid taken into the body. Patients who bleed are often thirsty, and are commonly treated by being given ice to suck, which means the introduction of a quantity of water into the circulation, and in addition to this they are often put upon a liquid diet of two pints of milk and one pint of beef tea in the day, which must still further supply fluid to the blood. I cannot help thinking this method is erroneous; and my own practice is to explain to patients the reasons why it is desired to diminish the amount of fluid that they take, and having thus engaged their concurrence, to give them as little as possible of any kind of fluid. It is often practicable, especially in the case of intelligent patients, to reduce the total intake of fluid to half a pint in the four-and-twenty hours, for a day or two at least. I fail to see any valid argument for the administration of ice. It is hardly conceivable that ice, even if it were swallowed in lumps (which is not usually done), could, while passing down the œsophagus, exercise a styptic effect over a bleeding area in the lung; while the addition to the blood of so much unnecessary fluid is a grave evil. If it be argued that thirst may be quenched and cough alleviated in this way, it may be replied that thirst can often be greatly relieved by the sipping of a very small quantity of water; that the suffering of thirst is a less evil than the risk of continued hæmorrhage; and that cough can be far better subdued by a

judicious use of morphia. With these views I lean to the employment of a spare semi-solid diet in hæmoptysis, such as a little milk pudding, bread and butter, thin sandwiches made with pounded chicken or hard-boiled eggs, &c., which can be increased in quantity and improved in quality as the hæmorrhage ceases and the lung clears up. Stimulants of all kinds should be avoided except under special circumstances.

Ordinary cases of pulmonary hæmorrhage due to tubercular disease are best managed, I believe, on the above lines; but in cases of extraordinary severity, as, for example, those in which a pulmonary aneurysm of some size has burst in the lung, all treatment is futile. It only remains to consider what modifications of medicinal treatment may be required in cases of *cardiac* hæmoptysis, and here we need the employment of two drugs which are not called for in the cases already considered, namely, digitalis and mercury. By means of the former drug we can increase the contractile power of the right heart, and in this way reduce the congestion existing in the lungs; and by the use of mercury, combined with saline aperients, we can greatly reduce the strain thrown upon the heart. Apart from the influence exercised upon the blood by the aperient action of mercury, it appears to have some obscure yet specific effect upon the heart itself. The great usefulness of the pill of mercury, squills, and digitalis, used in all our hospitals, is recognised by all who have used it in the treatment of dilated heart and impeded venous circulation, and probably its usefulness is as great even when we desire especially to influence the pulmonary circulation.

In closing may I repeat my regret that I have been unable to be more complete or more concise. My only hope is that the importance of the points I have touched on may, in some measure, make up for an incomplete treatment of the subject, and that the practical character of the suggestions submitted to you may excuse the length of the remarks in which they have been introduced.

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* While this lecture was under revision for the press an article entitled "Medical Hæmorrhage" has appeared in the 'Lancet' (p. 1314) of November 20th, 1897, by Dr. Frederick J. Smith, in which I observe with interest that iodide of potassium is recommended as a valuable drug in the treatment of internal hæmorrhage.

An Antineuralgic Liniment.—The 'Revue Médicale' for December 1st ascribes the following formula to Eulenberg:

℞ Ichthyol	...	...	...	... 5 parts.
Mercurial ointment		...	...	5 „
Chloroform ...	...	...	...	30 „
Camphorated spirit		...	...	30 „

M. To be shaken before being used.
N.Y. Med. Journ., Dec. 25th, 1897.

A CLINICAL LECTURE

ON

SOME COMMON AILMENTS.

Delivered at the West London Hospital, Hammersmith, November 10th, 1897,

By SEYMOUR TAYLOR, M.D., M.R.C.P.,

Senior Assistant Physician to the Hospital.

GENTLEMEN,—It is my intention to-day to offer you a few remarks on the treatment of some of the common ailments which one meets with in regular practice, and which I encounter in the out-patient department of this hospital. I find it comparatively easy to lecture to you on rare diseases, because there are points upon which one can dilate without quite knowing whether those signs to which one is referring are really in connection with the disease itself or are accidental evidence. Moreover, cases which are in the wards are fairly easy to diagnose, because they represent well-marked examples of disease; they are always cases of considerable severity, but that is not usually the case in general practice or in the out-patient department of a hospital. You scarcely need me to say that some of the less severe ailments are more difficult to treat than those which are very pronounced; and, as a rule, simple ailments are obscure in onset.

Amongst females in the out-patient department, especially amongst the young girls, one of the commonest, if not *the* commonest, is Chlorosis. As you know, a chlorotic subject will come complaining of three or four symptoms which are not important, while the cardinal symptoms are often, either purposely or in ignorance, held from the physician. That is to say, the patient will say she has got pale and is short of breath; and she and her friends who come with her attach very great importance to the flux at the catamenial period being suppressed or scanty. Very commonly such patients complain of cramp in the legs, and we find that their appetite is depraved, the depravity branching off in the direction of acid foods or condiments; that is to say, she will take abundance of pickles, sour apples, sour gooseberries, sour rhubarb, lemon squash. This acid craving is a distinct entity in these chlorotic subjects. Reverting for a moment

to the catamenial period, I think you will invariably find some effort at a flux at these periods; there always is on the part of nature some effort to pay a debt once a month; and although the catamenial flow may not be tinged with blood, if you take a sample and examine it microscopically, as I have done in twelve or fifteen instances, you will find that there is never a complete absence of blood-corpuscles. Now, what is the right treatment of these chlorotic girls? I find that most practitioners immediately put them on iron, notably the tincture of the perchloride cf iron. I also find that their experience coincides with mine, namely, that it fails to do any good at the onset. The text-books tell you that iron is the specific for a chlorotic girl; but experience tells you that you fail if you give the patient iron at first. The reason is that the stomach and intestinal canal are so out of order that they fail to digest the iron. The indication for treatment is always impressed upon me by the *leading* symptoms of these cases, namely, gastric trouble—the depraved appetite, the bursting sensation under the costal arch, the desire to liberate the stays, with the depression which comes to people who suffer from acute dyspepsia. And here I confess that I hold opinions which are regarded as somewhat heterodox. I have watched many of these cases, and after they have gone from the hospital supposed to be cured of their trouble, they have often come back, in from nine to twelve months afterwards with a definite gastric lesion—ulcer. My contention is, that in gastric ulcer you have not a primary disease at all; it is the summit of that illness of which chlorosis is the base. I can now call to mind several cases in private and hospital practice in which young women, of ages varying from eighteen to twenty-five, have suffered from chlorosis for two years, and then I have seen or heard of them suffering intense pain after food, with vomiting,—in fact exhibiting all the symptoms of a perforating ulcer of the stomach, —and they derive benefit from the treatment for ulcer of the stomach. Therefore the treatment in the first stage of chlorosis is to be directed to the stomach and intestinal trouble. I invariably begin with some slight purgative to clear out the intestinal canal. I then give an alkali, such as carbonate of soda, or the common hospital mixture of carbonate of soda, hydrocyanic acid, and gentian, three times a day before food. I

A Report to the Registered Practitioners of England and Wales.

LADIES AND GENTLEMEN,

I sincerely regret being obliged to make the following report to you, but the urgent nature of the matters composing it and my inability to secure the safety of those of your interests which are endangered, gives me no option but to discharge my personal responsibility as a direct representative member of the General Medical Council.

A. Re *the legal affairs of the Council, and action of the President thereon.*

In a paper which I read at the Annual Meeting of the British Medical Association at Carlisle in 1896, I drew attention to the dangerously arbitrary powers possessed by the President of the General Medical Council, and I showed how the business of the Council, especially the prosecution of certain offenders against the Medical Act, was adversely affected by the exercise of such powers.

Four months after the publication of my paper, the General Council commenced a revision of the penal procedures of the Council, and ultimately removed from the President the personal exercise of most of his power, and vested it in the Penal Cases Committee.

The fact that these precautionary measures have unfortunately not been sufficiently observed, or were not made sufficiently stringent, has led to a repetition in a very aggravated form of the evils to which I drew your attention at Carlisle in 1896.

The circumstances of the present case are as follows :—At the last Session of the Council, viz. November, 1897, the Council decided that a flagrant example of the special class of offenders against the Medical Act referred to above should be legally prosecuted on certain lines and on certain definite evidence which was before them.

At the end of December, 1897, from facts which came to my immediate personal knowledge, the conviction was forced upon me that unless a very radical change were at once effected in the conduct of this legal business, an unsuccessful issue would result.

Under these circumstances I felt it an imperative duty to write to the President informing him of the facts, and asking him to call the Penal Cases Committee as soon as possible, in order that the existing confusion might be rectified, he alone being invested with the power of calling such Committee together out of Session.

He replied that (1) such a proposal was impracticable; (2) that he did not intend to call the Committee; (3) that he had referred the solicitor's statements (upon which my opinion as expressed above was formed) back to the same source

for his opinion thereon ; and (4) had instructed the same solicitor to take the opinion of eminent counsel upon facts already laid before the Penal Cases Committee, and upon the report of which the Council had decided to act. Thus the President, after making a statement (No. 1) that was not correct, and refusing to take the only constitutional course open, namely, that of summoning the responsible Committee, assumed the direction of affairs, and reopened the matter which had already been decided upon by the Council, and in addition assumed the responsibility of ordering the great and useless expense of taking legal means to re-discover facts already known to and settled by the Council itself, with the concurrence of the legal assessor in the Session of last November.

On receiving the President's letter I immediately communicated the facts to two leading members of the Penal Cases Committee, one of whom I am aware endeavoured to persuade the President to summon the Committee, but was also unsuccessful.

I therefore wrote again to the President (who had not answered my former letter) asking him once more to call the Committee and to withdraw his instructions to the Solicitor as being a waste of public money. By way of reply to that letter I have only received a note from the President improperly suggesting that I should in future address my communications not to him (the only responsible person), but to the Registrar or the Solicitor, neither of whom of course have any authority or powers.

The present situation, therefore, is that the President, with what in my opinion amounts to a reckless disregard of fact and of constitutional right, is allowing the most important and serious work of the Council affecting the interests of the whole profession to remain in the hands of those who would appear to be unable to satisfactorily prosecute it. And further that he has without any authorisation whatsoever from the Council ordered a large and useless expenditure of the public funds of the Council.

My object in obtaining a meeting of the Penal Cases Committee was to have the whole circumstances properly investigated by the body competent to deal with them, and thus to secure matters of such difficult and delicate nature being properly dealt with.

That object has been frustrated by the action of the President.

As the Council does not meet until May, I am unable to call in question the President's conduct in the proper place before that date, and am therefore powerless to do anything to remedy either the present state of this special penal business of the Council or the expenditure in which the President has involved the Council. I am therefore constrained to make this public statement in order that the members of the profession may be made aware of the manner in which their interests are being menaced, and of the steps I have taken to protect their interests. That I have not succeeded is, I venture to point out, not my fault, but is to be attributed to the power still left by the Council in the hands of the President alone, and arbitrarily exercised by him.

B. Re *Practice in Italy.*

I desire at the same time to report to the electorate the following matter, which is the outcome of an official letter sent by the President of the General

Medical Council to the Privy Council, on July 1st, 1897, since I can obtain no answer from the President of the General Medical Council, to whom I have addressed the communication reprinted below. A grave legal error contained in his letter impugns the whole position of all medical practitioners in the kingdom, and being now published will, if possible, be made use of by every enemy to the profession, and every unqualified person who trades on the ignorance and fears of the public. It is necessary, therefore, to immediately correct the error referred to, and to warn the profession of the injury which the President's official pronouncement may, if left unchallenged, inflict upon its members. ...   .

The circumstances of the case are as follows :

The Italian medical profession are seeking to obtain from their government a statutory protection of qualified medical practice in Italy, and desire to make it compulsory upon any British subject practising medicine in Italy to pass the Italian state examination. Our countrymen who are so practising in Italy applied last summer to the General Medical Council to interest itself in their behalf. As no reciprocity is possible, since we do not admit foreign degrees to our Register except as *additional* titles, the General Council ordered a small committee to draft a letter to the Privy Council upon the subject.

This letter is the one to which I take exception. It is signed by Sir R. Quain as President of the General Medical Council, and after recounting in a way which in my opinion is erroneous and misconceived, the respective positions of a British practitioner resident at home and abroad, dilates at length on the injustice of the proposed Italian legislation, and suggests amendment of the Medical Acts in order that reprisals may be efficiently made when necessary by our Government. The letter is to be found on page 185 of vol. 34 of the Minutes of the Council, which has just been published. Immediately after this letter came to my notice I wrote to the President in the following terms, but have received no answer thereto beyond a formal acknowledgment.

<div align="center">[COPY.]</div>

<div align="right">25, CAVENDISH SQUARE, W. ;
30th December, 1897.</div>

SIR,

I beg to draw your attention to the following matter, which is of urgent public importance, and I submit requires prompt correction.

On page 185 of the Minutes of the Executive Committee (Meeting Nov. 22nd, 1897, vol. xxxiv, 'Minutes of the General Medical Council') is given a copy of a letter signed by yourself dated July 1st, 1897, and forwarded to the Privy Council in consequence of a resolution of the Council of May 27th, 1897 (see 'Minutes of the General Medical Council,' vol. xxxiv, p. 68).

In this letter occurs the following passage (page 186, line 17) : "the reason assigned for the proposed change is that Italian doctors are not permitted to practise in other countries of Europe, including the United Kingdom, unless they possess the diplomas of the countries in question.

"In contravention of this statement the General Medical Council desire to remind the Lord President that foreign medical men are under *no restrictions in Great Britain as* far as practice is concerned, and that the only disabilities under which they labour, if they do not possess a diploma registrable under the Medical Acts, are (*a*) that they cannot recover fees by legal process or sign certain certificates ; (*b*) that they are unable to give *medical* evidence in courts of law ; and (*c*) that they may not hold certain public offices. *They are absolutely free to practise their profession,* not only upon other foreigners, as British medical men may at present practise in Italy, but also *upon the Queen's subjects,* and upon foreigners resident within the Queen's dominions."

Since the name of no foreigner can be placed on the Register, except he possesses a British qualification, this statement assumes that any unregistered person may unrestrictedly carry on medical practice in the United Kingdom. In other words, that registration under the Medical Acts, 1858 and 1886, is of no value as regards practice, and that the Apothecaries Act of 1815 does not apply to foreigners practising in the United Kingdom, though unregistered and unqualified.

I beg to call your attention to the following considerations, which show that the statement in your letter to the Privy Council is incorrect, and that foreign practitioners who are unregistered and unqualified persons cannot practise unrestrictedly medicine, surgery, and midwifery in the United Kingdom.

1. The Medical Act of 1886 (49 and 50 Vict., cap. 48) contains a section, No. 6, which is headed "Effect of Registration," and in the marginal index is stated to describe the "*privileges*" of registered persons. This section in its commencement states as the first privilege that "on and after the appointed day a registered medical practitioner shall, save as in this Act mentioned, be entitled to practise medicine, surgery, and midwifery in the United Kingdom." Thus the privilege of practising medicine in the United Kingdom is conferred by the Act on registered persons alone in precisely the same way as the second privilege conveyed in the section, viz. that of recovering professional charges by process of law, is alone bestowed upon registered persons. The punishment of persons who commit breaches of this section, and who practise without being registered, is provided for in Section 40 of the Medical Act, 1858. An unregistered foreign doctor, therefore, practising in the United Kingdom would come under the restrictive penalties of these sections of the Medical Acts.

2. The Apothecaries Act, 1815, provides that persons who do not hold the registrable qualification, viz. licentiateship of the Society of Apothecaries, and who nevertheless practise medicine, shall be punished under the penal section No. 20. This statute has been successfully employed for the punishment of unregistered and unqualified foreigners (including Italians) and others attempting to practise medicine in this country.

An unregistered foreign doctor, therefore, practising in the United Kingdom, would come under the restrictive penalty of the Apothecaries Act, 1815.

The incorrectness of your statement cannot fail to have a gravely prejudicial effect on the manner in which the Government, *i. e.* the Privy Council, will regard the existing Medical Acts, and also directly compromises the value of any official letters which may be sent in the future by the General Medical Council to the Privy Council. Under these circumstances I shall be much obliged if you will kindly inform me as soon as possible what steps you propose to take to correct the erroneous impression conveyed by your letter, which has unfortunately now become public property, by being published in the current volume of the 'Minutes' of the Council.

I take this opportunity also of giving notice that at the next Session of the Council I shall move that a letter of rescission, withdrawing your letter of July 1st, 1897, be forwarded to the Privy Council.

Yours faithfully,

VICTOR HORSLEY.

SIR RICHARD QUAIN, BT., M.D.,
 President, General Medical Council.

In my opinion it is clear that a certain injury to the authority and reputation of the Council cannot fail to have been inflicted by the President's letter, and it is equally certain that we cannot obtain a *tabula rasa* until the Council meets and formally repairs damages by admitting that the letter sent to the Privy Council by the President was inaccurate.

However, by giving publicity to the matter and early contradiction to the President's statement, I think the profession will be able to prevent any injurious use being made of it during the five months that must elapse before the May Session.

VICTOR HORSLEY,
 Direct Representative for England and Wales.

secure that they have a daily action of the bowels by cascara, or by some aperient mineral water taken in the mornihg, fasting. After a fortnight of such treatment, when the bowels have been thoroughly emptied, you may begin to give iron in one or other preparation, such as Blaud's pills, sulphate of iron, or Griffith's mixture—a very excellent mixture, but now being superseded, for what reason I do not know. Another preparation which seems to suit these chlorotic girls admirably is manganese. There is a preparation made by a German chemist, Gude, Liq. Mangano-ferri pep-tonatus, which can be obtained at Roberts' in Bond Street, and which I have found give very excellent and rapid results in the treatment of chlorosis. We cannot use it in the out-patient room because it is very expensive, so that we have therefore to use the preparations of iron given in the Pharma-copœia. It is also necessary that you should estimate the amount of hæmoglobin in the blood; it is not necessary to count the blood-corpuscles, but it is necessary to ascertain the wealth of hæmoglobin, and for this purpose there are several instruments in the market, but I cannot say which is the best.

I now come to another condition which is extremely common, especially in women, namely Constipation. The importance of constipation has been and is very much overrated by the profession. I have known patients go through their work with ease and comfort with a relief of the bowels only once a week; indeed, I have known people who said it was common for them to go eight or ten days or a fortnight and then the relief was only a small mass. I am not going to say that such a state of affairs is an advantage to them, but I would impress upon you the fact that many people who are constipated go through their work without any apparent ill effect. But inasmuch as there are some serious results which arise from constipation I do not wish to underrate its importance. In the first place, it appears to be a natural thing for women to be constipated. I should think that, in towns at any rate, fully two-thirds of the women suffer from constipation, that is, they go without a daily relief of the bowels, and in very many instances I have no doubt in my own mind that it is due to their method of dress. The corset is not a thoracic garment so much as an abdominal one. The

patient will say "I am not at all tightly laced" (pointing to the chest). Of course if she were to compress the upper thorax she would suffer from dyspnœa; but she can and does compress the lower ribs without much discomfort. My idea is that this pressure retards or arrests that peristaltic action which is so necessary for the daily evacua-tion of the bowels. This condition is not present in man's dress, and that, I think, accounts for the greater preponderance of the trouble among the female sex. Some years ago I made inquiries on this point in this country and abroad while on a holiday. There I found that the workwomen in the fields did not suffer from constipation; and in these cases, practically without exception, the corset was unknown to them in the working days. The worst cases of constipation I have met with, on the other hand, are amongst the young ladies who have to study their figure and their appearance, such as those who are working in milliners' shops, as well as ladies in the higher walks of life. These people suffer more from constipation than any other class. I am sure the cause is not want of exercise, since the rich have plenty of exercise in horse-riding and the various games which are getting more in vogue than ever. Therefore you will be prepared to hear that I consider the principal reason for the constipation in the majority of cases to be the corset. These constipated patients suffer also from pains in their flanks, which is due to the pressure of the corset upon the splenic and upon the hepatic flexures of the colon. The ascending colon does not form a right angle with the transverse colon, but goes right underneath the liver, then it descends before crossing the belly, and again ascends at the spleen prior to becoming the descending colon. At the top of each flexure, therefore, we find an accumulation of flatus which gives rise to the distress which these patients suffer from. I have told these people that if by any chance they can manage to give up their particular dress for a fortnight or three weeks while under treatment, they will find great relief and the constipation will be ameliorated.

As regards the treatment of constipation, I find that even in the inveterate cases, castor oil in small quantities is one of the most efficacious drugs which you can give; it is not necessary in ordinary practice to prescribe a more severe remedy. If you give a violent purge you unlock the bowels

for the time, and then in two or three days' time they are as bad as ever. But by small doses (one drachm) of castor oil, taken fasting, the bowel is coaxed into its proper action. But the oil should be continued for several weeks. Cases which are not relieved by this treatment are very much aided by the addition of almost homœpathic doses of croton oil with the castor oil, say from one-sixth to one-quarter drop in each drachm of castor oil. Cascara is a favourite drug with the profession just now; but I would invite your attention to the fact that no two preparations of cascara seem to be alike. I have had the complaint made to me by patients that if they get cascara in one town or part of a town, and they get another supply in a different town, the latter may have no effect whatever upon them ; while when obtained at still another place the effects have been so violent that it had to be stopped. So real a drawback has this become that a firm of French chemists have advertised a cascara made in such a way that the strength is known and is quite reliable. I do not wish to go through the purgatives in the Pharmacopœia, but we have two others which are extremely useful in obstinate cases of constipation, namely, euonymin and iridin. I am not in the habit of writing long prescriptions, but in writing a purgative pill I think you will find that three or four ingredients are useful. A conviction is gaining ground in my mind that in our therapeutics we are doing wrong by taking out from our drugs a certain active principle for use and throwing the rest away. To illustrate my meaning I may say that I am sure that digitalin is not so efficacious in heart disease as digitalis ; liquor strychninæ is not so efficacious in the treatment of constipation as a corresponding dose of the tincture of nux vomica. I think we have only taken out one principle from the drug, and that it may yet be found that the constituents which we abandon have very distinct uses. There are apparently some other principles in strychnia which are very useful in promoting the peristaltic action of the bowels.

Next as regards the diet in constipation. I need hardly tell you that people suffering from constipation should have a restricted animal diet, and that the food should largely consist of vegetables. You find bovines, who subsist largely upon grass, practically suffering from chronic diarrhœa, whereas

carnivorous animals perhaps have an evacuation only once in five or six days. An article of diet which should be mentioned here is tea. The doctor is frequently asked by a patient suffering from constipation, " Is tea a bad thing for me ? " and I must confess that if it is properly made, that is to say, infused for a short time only and not stewed, I have not encountered above two or three cases a year in which tea has been any disadvantage. I feel sure that, as a profession, we have got into the habit of tilting at tea as being undesirable for our patients. I would rather take the other side and admit to you that in cases of mental overwork, and indeed of bodily overwork also, I have oftener seen good accrue by a cup of freshly made tea than harm in any form arising from it. Let me be understood, I have no doubt tea does give rise to a form of indigestion, but it is not tea properly made, it is a stewed decoction.

Let me now touch upon another condition which is rife,—Diarrhœa, the opposite of the condition just referred to. The principal causes of diarrhœa may be stated under three heads : (1) functional disorder of the gastro-intestinal canal ; (2) organic disease of the intestinal canal ; (3) the effect of some irritant upon the intestinal canal, such as a poison.

Functional diarrhœa occurs in people who have mental distress, worry, and harassment, and in women who are strongly neurotic, and in children who have had a sudden change of food to a dietary to which they are not accustomed. Cases of diarrhœa occur or are brought under your notice in the children who are home from a boarding-school, where they have been having a healthy, wholesome diet at fixed hours, and who, when they come home, are allowed to run riot in the pantry, so to speak. We therefore find their stomach and intestines rebelling against the sudden change.

Then as to diarrhœa due to organic lesion. This may be due to enteritis, or to a gross lesion of the small or large intestines, such as a malignant growth or dysentery.

Lastly comes the diarrhœa due to poisons. Physiological chemistry tells us of ptomaines and other poisons which may enter the intestines, as well as those poisons which are more purely chemical.

As to the treatment of these cases, I find a

neurotic woman who comes complaining of having six or eight stools a day is quickly relieved by alkalies with the addition of arsenic—small doses, say four drops of the solution. Diarrhœa from anxiety and mental strain is best met by rest and change. The treatment of the boy who has committed indiscretions in diet is by purging out the irritating food and putting the lad upon a simple milk and farinaceous food. As to the diarrhœa of organic disease, you will be surprised to find that in, say, malignant new growth of the large or small intestine, good results are frequently obtained by small doses of iodide of potassium. I confess to you I do not know how it acts, but many of the effects which we have obtained from our medication are empirical and not based upon scientific research. To the iodide of potassium you may add bismuth, but it is essential that the bismuth should be given in some form of mucilage, not only to suspend the bismuth but to act as a soothing application to the irritated surface. The mucilage of tragacanth or of acacia may be used, as without such vehicle the stomach seems to get hold of and absorb the drug too quickly, and thus prevents its topical action on the colon. In speaking of the treatment of diarrhœa due to poisons, I need only draw your attention to the fact that certain poisons have to be treated by their antidotes. Now comes the question, can we act upon the intestine so as to disinfect the canal, or arrest the septic evolution? There is one drug which I have found extremely useful in this connection, namely salol. It is not only useful in enteric fever as an antiseptic, but also in those other forms of diarrhœa due to ptomaines and other irritants, such as decomposing articles of food. I give four, five, or six grains suspended in mucilage.

There is one rule I have found extremely useful in writing prescriptions for obstinate diarrhœa. It is this: so long as the tongue is not abnormally red or beefy—that is, so long as there is a fair amount of fur upon it—alkalies and vegetable astringents are the most effective; but if after a time the diarrhœa continues and the tongue becomes glazed and raw, I find it best to give mineral acids, such as sulphuric acid, and opium with it.

Another subject about which I should like to speak is the treatment of Enteric Fever. At this time of the year, namely, from July to December, you are likely to meet with cases of enteric fever. From the statistics which I have gathered I find that the epidemic begins about the end of July, increases through August, September, October, reaching its maximum about November, and then the curve begins to fall. I need hardly mention Maidstone as an example, and I venture to predict that during the next month the number of cases there will be sensibly diminished, though there will be a few cases well into January. Now, there are two essentially different conditions in enteric fever, of which one obtains in hospital, the other in private practice. In enteric fever in hospital, constipation is a common symptom. I do not say diarrhœa does not occur in hospital, but constipation is very much more frequent in hospital than in private practice. On the other hand, diarrhœa is comparatively frequent in private practice. I think the reason of this is that in hospitals, where the regulation of the diet is so strict and the nurse is so careful not to allow any extraneous food, that the milk diet causes constipation. I have noticed that over and over again in watching different epidemics at hospitals. The treatment I wish to advocate on this text is that there should be a medium between constipation on the one hand and diarrhœa on the other. Constipation in enteric fever is dangerous, so is diarrhœa. Three or four evacuations a day are enough; if there be more than four stools per diem you must watch the patient, and check the diarrhœa. Some years ago, in looking through his results, I found that one physician, Dr. Harley, who had had great experience in the treatment of typhoid at the Fever Hospital, used to give small doses of grey powder in these cases,—pulv. hydrarg. cum cretâ three grains three times a day,—and his results were extremely happy, his mortality was small and his relapses comparatively few. I have always since that time based my treatment on the same lines. Possibly the mercury by increasing the biliary secretion keeps up a gentle action through the intestine, and so gets rid of the morbific effect of the poison; possibly it may have an action in promoting asepsis. Salol also comes in useful here; its action is supposed to be chiefly as a disinfectant or antiseptic in the intestinal canal. I would also like to remark on the line of danger in typhoid fever. I have found

that 105° is a dangerous height,—that is to say, a patient whose temperature has reached that point is always in great peril. The majority of the patients whose temperatures have reached that level have either died in the primary attack or have had a relapse subsequently, and have died in the relapse. A German authority has put the danger signal a little higher, but in Germany I believe typhoid fever is more severe, almost amounting to a different type, than is commonly seen here. Certainly a temperature of 105° should make you give a very grave prognosis. Now comes the question whether we ought in these cases to give a graduated bath. I am strongly in favour of that measure in hyperpyrexia, providing I be allowed to choose my patients. I would not sanction the giving of a bath at a temperature of 100° and bringing it down to 70° within twenty minutes, for every patient; I should require to feel satisfied that his circulatory and respiratory organs were fairly healthy. I have seen some patients who had marked pulmonary congestion or bronchial catarrh die after a graduated bath, and I am strongly of opinion that the bath in these instances had hastened the end. As to relapse and recrudescence, there are one or two things which will start a relapse which are not sufficiently recognised. We know quite well that a relapse may date from an error in diet. But the article of food which to my mind is poison to a typhoid fever patient is bread. It is impressed upon me by incidents at my old hospital. Patients who were going on extremely well towards recovery had been allowed to have some bread and milk, and immediately afterwards up went the temperature and they have had a genuine relapse, or at least a recrudescence lasting at least six days. Another thing which will bring on a relapse or recrudescence (a recrudescence being practically an abortive relapse) is a purgative or an enema. A constipated patient may have such a rise of temperature after a purgative or an enema that you will be alarmed. I have seen not a few of such cases during the last three or four years. I have been able to assure the relatives that the danger was more apparent than real when I have found the temperature rise after a laxative had been given in the morning, the effect of which had probably been to liberate a colony of bacilli in the retained fæces.

I would like to conclude by mentioning some points in the treatment of patients suffering from Valvular Disease of the Heart. My experience is probably the same as yours, that valvular disease of the heart is not the tremendous and disappointing disease that it was considered by our grandfathers. You must know many patients who are going about their daily occupations with marked valvular disease of the heart, who yet seem to be none the worse for it. Those patients do not require any cardiac tonic. Nature is the best physician up to a certain point, and she is curing your patient by securing to him or her compensation by hypertrophy of the chamber behind the valve which is affected. But there comes a time when Nature gives up, and then we have to resort to science and skill to relieve the patient. The indications of this stage are dropsy of the legs and ankles, increased dyspnœa, œdema at the base of the lungs, and so on. The best heart tonic is an old one, digitalis; but we have in addition strophanthus and convallaria and strychnia. I have already told you that I am not in favour of taking digitalin out of digitalis. You will find that in the treatment of heart disease digitalis at a certain stage fails to create any response. Then one tries convallaria, but the heart fails after a time to respond to that. Then you may try strophanthus. Even under that compensation begins to fail after a time. You may then begin to despair. If at that period of despair you will give all three drugs together, you will frequently find the results are startlingly effective. I can remember distinctly two patients this year who were apparently dying, and who had had digitalis, strophanthus, and convallaria at different times but not together. We gave them digitalis, convallaria and strophanthus, and in both cases the men were sitting up in bed or in a chair with limbs almost quite free from dropsy, in a week.

Finally, in the condition which is so rebellious to treatment, mitral stenosis, what must you do? You will find you can produce immense relief to your patient by, from time to time, say twice a week, dry-cupping him over the base of the lungs. The cupping glass is not at all fashionable of late years; indeed, many of the practitioners now-a-days have not been taught how to use it properly. But it is of extreme value in the medical wards. The lung is acting as a sponge and keeping the blood

in its capillaries which has been dammed up by the stenosed mitral orifice. After a time, as the lungs get more engorged, the liver becomes enlarged and congested, so that you may apply leeches or cupping glasses over the liver also. You will also find that two- or three-grain doses of calomel every day will produce excellent results. Dr. Stone, one of my old teachers, used to argue that calomel had a direct stimulating effect upon the ventricle itself. He may be right; I shall not contradict him. When he prescribed calomel in three-grain doses every morning it was found that the liver dulness diminished and the œdema of the lung became less marked, the patient sitting up a few days afterwards comparatively free from distress.

I fear that this address contains nothing new, but I have endeavoured to emphasise some old lines of treatment which in these days of modern pharmacy are apt to become overlooked.

New Treatment of Ozæna.—Seven cases of ozæna treated with antidiphtheritic serum are reported by Campaired ('Annales des Maladies de l'Oreille et du Larynx, &c.,' No. 5, 1897). From four to twenty-seven injections were given, varying in quantity from four to twenty centimetres. The dosage should be small at first, and gradually increased. First the odour disappeared. Then œdema of the mucous membrane was observed, with increase and fluidification of secretion. The membrane became more red, and the crusts grew softer as the number of injections increased. Nasal irrigations of warm, sterile salt water were used during the treatment.

Western Med. and Surg. Gazette.

Malted Cocoa.—This is an extremely good combination of Messrs. Fry and Sons' pure cocoa extract with Messrs. Allen and Hanburys' extract of malt. The diastase is preserved from injury by drying at a gentle heat; the nutritive and digestive powers of this preparation are of great value in exhaustive diseases and for delicate children. This article of diet is convenient to prepare, and handy for immediate use, not requiring any boiling.

DEMONSTRATION OF CASES

At the Monthly Meeting of the North-West London Clinical Society, November 17th, 1897.

Dr. MILSON in the Chair.

Congenital Defect of Chest Wall.

Dr. G. A. SUTHERLAND showed a boy æt. 11 years, who presented a congenital deficiency of the chest wall on the right side. The pectoral muscles were entirely absent over an area extending from the second to the fifth rib, and from the costal cartilages to the anterior border of the axilla, the skin was thin, the subcutaneous fat was absent, the ribs were atrophied, and the intercostal muscles wasted. On coughing there was a protrusion of the lung through the third and fourth intercostal spaces. The deltoid and scapular muscles on the same side appeared to be hypertrophied, probably from their increased action in the absence of the pectorals. As the result of the deficiency in the chest wall, a marked flattening was present, and the circumference was much less on the right than on the left side. There were no associated lesions, and the use of the arm was apparently not interfered with as far as the boy's experience went. The exact nature of the lesion was obscure, but a considerable number of practically identical cases had been recorded, which pointed to a common cause. The most generally accepted view as regards ætiology was that the condition depended on local pressure during intra-uterine life, either from another child in the case of twins (which was possible in this case), or from some part of a limb of the same child, or from some of the extra-uterine structures, *e. g.* the pelvis.

Mr. TEMPLETON referred to a similar case he had seen in which there was absence of the anterior part of the third, fourth, and fifth left ribs. The posterior abdominal wall on the same side was defective, and through the gap several coils of intestine protruded.

Dr. LEONARD GUTHRIE remarked that if, as had been suggested, the deformity was caused by pressure of the arm upon the chest in uterine life, some pressure must have been exerted through the arm to the chest, and therefore the arm and chest should have suffered equally. He mentioned a

case in which the cartilages of all the left ribs from the fifth downwards were absent, and also another in which the abdominal muscles were all undeveloped, and questioned whether such deformities could be produced by pressure. He regarded all such deformities as developmental imperfections.

Dr. SUTHERLAND admitted the pressure theory was not proved; but, on the other hand, he might refer to the extent to which the deeper structures were involved. The affected area of the chest wall might be small, but all of the tissues in that part were more or less atrophied.

Subhyaloid Hæmorrhage.

Dr. BATTEN showed a case of subhyaloid hæmorrhage of the retina in the left eye. The patient was a woman about 65 years of age, who, a year previously, had had an attack of hemiplegia, but otherwise appeared in good health. The condition, he said, was one of some rarity, and consisted in an extensive extravasation of blood occurring in the macular region, forming a hemispherical mass of blood about twice the diameter of the optic disc. The collection of blood had become partially absorbed, and remained fluid, as evidenced by the upper surface being quite level. Above the area covered by blood there was a whitish area of retina—the presumable source of the hæmorrhage. There was no evidence to show that the hæmorrhage proceeded from a miliary aneurysm, and, indeed, it was hardly possible that it could have done so, seeing that the macular region has no visible blood-vessels, and it was hardly conceivable that an aneurysm could form in the very minute capillaries. The hæmorrhage in these cases differed markedly from the ordinary retinal hæmorrhages, such as occur in other parts of the fundus. It must be classed with the large spontaneous hæmorrhages, such as occur in otherwise healthy eyes, the origin and cause of which are still doubtful.

Optic Atrophy.

Dr. BATTEN also showed a case of optic atrophy in a man æt. 32, which presented unusual symptoms. Both optic discs were pale and excavated, the left being markedly atrophic, the right rather less so. The vision in the left eye was reduced to $\frac{3}{60}$, while the right still had $\frac{6}{12}$. The right pupil acted slightly to light; in the left no reaction

obtained. Both pupils reacted to accommodation. Both visual fields were constricted, the left markedly so, and there was a total central scotoma, for white as well as colours in the left, while in the right there was no scotoma. His sight had failed in the left eye about one month before he applied for treatment. He smokes about a quarter of a pound of "shag" per week; he appears in good health, and sented all history of injury or disease. He predenies certain nervous symptoms, for which he was sent to Dr. Guthrie for examination.

Dr. LEONARD GUTHRIE said he had endeavoured on several previous occasions to elicit symptoms and physical signs pointing to locomotor ataxy or other wide-spread nervous disorder in Dr. Batten's patient, but had failed to do so. The pupils did not, in his opinion, show the typical Argyll Robertson reaction. They were somewhat dilated, and the right at all events contracted to light, though sluggishly. He asked whether the condition might not be due to the amaurosis present. The defect in speech dated from early childhood, and consisted in inability to pronounce consonants. It had been termed by the late Dr. Hadden "idioglossia." The knee-jerks were extremely difficult to obtain, but he had satisfied himself of their presence. The patient had no ataxic symptoms, and Romberg's sign was absent. He (Dr. Guthrie) had carefully sought for evidence of anæsthesia and paræsthesia in the trunk and limbs, but had found none. It was possibly a case of preataxic locomotor ataxy, but for the present he could only regard it as one of primary optic atrophy complicated by tobacco amblyopia.

In reply to Dr. Guthrie, Dr. BATTEN said that he did not think that the optic atrophy could alone account for the defective action of the pupils to light, seeing that at the time of his first examination the vision in the right eye was fairly good. The total scotoma in one eye was not usual in tobacco amblyopia, and pointed rather to some central disease.

A case of Arthritis associated with Warts.

Dr. KNOWSLEY SIBLEY showed a woman 56 years of age, who for the last seventeen years had been a great cripple from rheumatism, but under the Tallerman treatment of hot dry air baths she was able to walk with her head erect without

either crutches or sticks. She presented an interesting condition of multiple warts, which had on more than one occasion more or less spontaneously disappeared. Two years ago she had numerous warts round her waist, and these disappeared without any local treatment. The last two or three months the warts have reappeared, and now formed a broad band on the anterior and lateral regions of the abdomen, and a few on the back.

Urticaria.

Dr. CHITTENDEN related the following case :— An unmarried woman aged 34, slightly anæmic, with normal catamenia and general health good,

epigastric fulness, followed by the vomiting of a large quantity of blood from the stomach. She felt relieved,. and the urticaria in a few hours entirely disappeared. She was entirely free from it till early in October, when it again reappeared ; on this occasion salol was tried, salicylates and bromides, with rest and milk diet, and gave only partial relief. But a few days ago she experienced the same nausea, and brought up a still larger quantity of blood (three to four pints) from the stomach, followed by great relief and total disappearance of the urticaria. He asked whether the gastric disturbance was the cause of the urticaria, a complication, or was it possibly a rare

INTRA-UTERINE AMPUTATION OF FINGERS.

consulted him last July, suffering from a most severe form of urticaria extending at times nearly over the entire body. Saline purgatives and alkalies had been given, but without any benefit. Viewing the case as a neurosis he prescribed liberal diet, tonics, such as arsenic, &c. In three weeks' time she was no better. He sent her early in August to the seaside. Two days after her arrival she suddenly experienced a sense of nausea and

and anomalous form of hæmophilia ? The eruption was in no way purpuric, but presented the typical and well-marked wheals of urticaria.

Intra-uterine Amputation of Fingers.

Mr. TEMPLETON showed a woman 32 years of age, the fingers and distal part of the palm of whose right hand had been amputated *in utero*. A skiagram of the part was exhibited illustrating

tapering of the metacarpals, especially the middle one ; a small nodule at the base of the first phalanx of the thumb was also to be noted. The carpus and bones of the forearm were complete. The stump was very satisfactory, and the power of opposing the first metacarpal was retained, so that the limb was of considerable use. Mr. Templeton remarked that in all probability removal had taken place early in fœtal life from constriction by the cord or by strands of adhesion. In some instances the constriction occurred at a later period of intra-uterine life, the limb died, underwent a certain amount of maceration, but at birth separation had not yet taken place.

Abnormal Course of Radial Artery.

Mr. TEMPLETON also demonstrated the abnormal course of the right radial artery in a man 54 years of age. Instead of passing as low as the inner side of the base of the styloid process of the radius, the vessel crossed the tendon of. the supinator longus two inches above the lower end of the bone, passed over the extensors of the thumb, avoiding the "tabatiere anatomique," and dipped between the two heads of the abductor indicis.

Infantile Paralysis.   Prolonged Treatment and Recovery.

Mr. MAYO COLLIER showed a case of apparently almost complete recovery from marked paralysis of the left lower extremity of three years' duration. The treatment had been persisted in for two and a half years. When eleven years old the child had been admitted into the hospital with a cold, para-lysed, contracted, and withered leg. After the tendo Achillis and posterior tibial tendons had been divided, and the foot had gained its normal position, galvanism, massage, and frictions were re-sorted to. At first the reactions of degeneration were well marked, and only slight response was evoked by the continuous current, slowly interrupted. This treatment was persisted in, and from a crippled and useless condition the limb has so far recovered as to leave little to be desired. The patient now walks well and for miles without the least assistance, and the movements of the foot are practically perfect. Mr. Collier maintained that the case illustrated the contention of Duchenne that persistent and long-continued treatment in these cases gave the best prospects of cure.

REVIEW.

Cleft Palate ; Treatment of Simple Fractures by Operation ; Diseases of Joints ; Antrectomy ; Hernia, &c. By W. ARBUTHNOT LANE. (Me-dical Publishing Company, London. 5s.) Text-books on surgery are plentiful enough, yet how often are their pages consulted by the hard-pressed practitioner of modern times with but unsatisfactory results. The future successes in surgery will undoubtedly rest on the lines of advancement so clearly indicated by Mr. Arbuthnot Lane, and the medical profession are to be congratulated that in this book at least the shackles of tradition, have been fearlessly cast off and first principles boldly and successfully applied to the art and science of surgery. This volume is unique of its kind, and one cannot help admiring the enthusiasm of its gifted author in submitting the methods and practice of surgery to the most searching tests. A proper understanding of the volume is much helped by the simple and lucid style of Mr. Arbuthnot Lane. The subjects discussed by the author in this volume are treated in a scientific spirit, and are models of careful and exact methods of observation. The remarkable progress in surgery foreshadowed by this volume is perhaps nowhere better shown than in the pages setting forth the author's views in regard to the treatment of fractures by operation. In our opinion this volume of papers, taken as a whole, is of the very highest order of excellence, and merely looked at from the point of view of the medical man who wants nothing except it will pay and pay immediately, this book is worth acquiring. In these days of utilitarianism the value of a book depends on its usefulness, and it can safely be asserted that if this volume has any one particular characteristic, it is that of being useful and helpful ; and beyond that, by reason of the writer's peculiar gift of imparting some of his zeal and scientific accuracy to the reader, the volume stands out pre-eminently as an excellent example of what clinical teaching should be. The work is replete with abundant evidence of the writer's original work and his own well-matured views ; these views impart a peculiar value to the volume, for they depart widely from generally accepted teaching, and this divergence is ably justified by the author, whose brilliant advocacy of his methods and technique is rendered more valuable by reason of the abundant clinical experience which enriches the work and fascinates the reader. In short, the volume is most interesting to read, and abounds with instructive facts and arguments. To ade-quately review this thoughtful and suggestive volume would require more space than is at our disposal, and it can only be said in conclusion that the work merits not only to be read, but to be also carefully studied.

A CLINICAL LECTURE

Delivered at Guy's Hospital, November 27th, 1897,

BY

P. H. PYE-SMITH, M.D., F.R.S.

*A Case of Paralysis of the Fifth Cranial Nerve, with
Remarks on Empyema after Pneumonia ; Blister-
ing, Cupping, and Bleeding ; Typhlitis ; Syphilis
of the Lung ; Hæmorrhagic Measles.*

GENTLEMEN,—In the first place I will briefly refer
to two or three interesting cases in our clinical
wards, chiefly from the point of view of treatment,
and will then draw your attention to a remarkable
case of paralysis of the trifacial nerve.

1. You will remember that last week I men-
tioned the case of a boy of 14 who came in
with pneumonia, and afterwards had dulness at
one base. It was a question between tubercle and
empyema. I told you the ground upon which we
concluded he had empyema. We put in a syringe
and obtained pus ; it did not contain any tubercle
bacilli nor streptococci, but pneumococci alone.
When there are streptococci or staphylococci
present the cases always need incising and drain-
ing. A year ago I had a case in which pneumo-

cocci were found ; we tried aspiration, but the pus
returned, and we had to incise and drain after all.
(Effusion occurred for a third time, but the parents
removed the boy from the hospital before the
operation could be performed.)

2. There is another younger boy in the ward
who had pericarditis (probably rheumatic) with
effusion. After waiting for a week we put on a
blister, and followed this by a second. The result
is that the fluid has disappeared. I say the result,
not necessarily the effect, you must judge of that
for yourselves. From experience of similar cases
I for one believe that when there is serous effusion
into the pericardium a blister will often remove it.

3. A child with acute and severe nephritis.
There is very scanty urine, and it is full of blood.
We put a dry-cupping glass on his loins, and the
result was diminution of blood and increase of
urine. The best results from wet and dry cupping
I have seen have been where it has been applied
to the loins in acute Bright's disease with more or
less complete suppression of urine. (He made a
good recovery.)

4. Then there is the case of typhlitis I spoke
about last week in a young man ; and a young
woman suffering in the same way has come in
since. Both are doing well under the medical
treatment of absolute rest in bed, and absolute
limitation of diet to liquids, chiefly milk, and
enough opium not only to relieve the pain, but
also to keep the bowels quiet. (Both recovered.
Two other cases with suppurative perityphlitis
were afterwards admitted and operations per-
formed.)

5. A man about 50 is very ill with bronchitis.
and has been twice relieved and possibly his life
saved by bleeding from the arm. The case is a
good illustration of the benefit of that treatment.
Bleeding does not cure any disease, or even
produce a permanent effect for good : but it pre-
vents patients from dying from the stress of acute
disease, and in that way you will find it save
many lives. (He recovered well, but a somewhat
older man with more chronic bronchitis and ex-
treme emphysema was bled with no good result,

and died with dilated right heart and nutmeg liver.)   •

6. In Miriam Ward we have a woman aged 33 with diabetes, in whom strict diet has prevented all appearance of sugar in the urine. Thirty-three is not the best age for this condition; it is too young for a slight case, though too old for the worst cases. What are you to do when you have got rid of the glycosuria, and we may infer of the glychæmia? Patients always wish their diet to be relaxed, and especially to have bread. We gave her one ounce of bread, and for the first twenty-four hours no sugar appeared in the urine. The next day she had again an ounce of bread, and when that day's urine was collected it was found to contain sugar. For the prognosis you may divide diabetes into three groups :—(1) Mild cases, which under strict diet no longer pass sugar after their meals; their symptoms disappear, they regain weight, and after a time you may withdraw the restriction in food and still they do well. (2) Bad cases, in which you withdraw all carbohydrates, *i. e.* sugar and starch from the diet, and still you find them thirsty and wasting and weak, with sugar in the urine obtained from their nitrogenous diet. These patients are sure to die. (3) Intermediate cases, in which you get rid of the sugar by dieting, but as soon as you relax your rules and give a greater variety of food the sugar reappears. In such cases go back to the strict dietary for another month or so, and then try again in the hope that the sugar will remain permanently absent. This is how we shall treat our present patient.

7. The three cases of abdominal obstruction treated by operation of which I spoke last week, are all doing very well. One was a colotomy, another colotomy with excision of the malignant tumour, the third laparotomy with excision of the first fold of half mortified gut met with, and recovery with an intestinal fistula. (All recovered.)

8. The next case is one in the isolation ward of a little boy somewhat over 2 years old, who was brought in with the following history. He had been a healthy child until a week ago. Last Saturday (this day week) he was more than once sick. There are three signs which may mark the invasion of a severe illness,—rigors, convulsions, and vomiting. Vomiting, as you know, is an easy reflex action with little children, and convulsions are common; both may be occasionally observed in adults at the onset of an exanthem or of pneumonia.

The child was ill on Sunday, and some time on Monday the mother noticed a rash. That would be on the third day, rather early for the rash of measles to appear. But it was not quite too late for scarlet fever, the rash of which ought to appear on the second day, but may be postponed until the third. When the child came in there was no question that it had measles and not scarlatina, for there was no sore throat, but cough and running at the eyes and nose, with evidence of bronchitis or broncho-pneumonia. Moreover, the rash was that of measles. It began on the face, where it was fully out, whereas scarlatina begins on the neck and shoulders and clavicles, and is seldom fully out on the face. The eruption was in blotches, whereas that of scarlatina is punctate. It was purplish, rose-coloured; you would represent it if you were making a water-colour drawing by adding blue to carmine, and using a large brush and washing it in : whereas the rash of scarlatina is a brighter red, and you would represent it by vermilion with possibly a little yellow added, using a pointed dry brush and stippling. So the locality, the time at which the rash appeared, its shape, and its colour, all indicated measles and not scarlet fever. It was an unusual form of measles, that which has been long known as hæmorrhagic. The worst cases, called "black measles," are now almost unknown; I have never seen one. Hæmorrhage may also occur in the rash of scarlatina, and in all the exanthemata it is a grave sign. In ordinary cases of measles, children do not die of the disease, but of its sequel, bronchitis or broncho-pneumonia. This child had inflammation of the lungs, and also cutaneous hæmorrhage, which showed that it was a severe form of poisoning. The pulse was excessively frequent, at one time over 200 a minute and weak. Its respirations were also very rapid, at one time 82 in the minute. The case was treated as one of collapse; the child was first warmed and then stimulated with brandy and beef-tea and port wine, given partly by the mouth and partly by the rectum. I also gave digitalis to lessen the extreme rapidity of the heart's action. By these measures the child's condition improved, but soon after it became excessively restless —a very bad sign, almost as bad as lethargy. On

coming into the hospital this morning I was told that the child died since I saw it yesterday. We shall find nothing but the effects upon the lung in bronchitis, lobular hepatisation and collapse. There will be nothing to show that the child died of measles; but we shall very likely find more or less extensive hæmorrhage in the internal organs corresponding to the rash on the skin. (There was extensive lobular hepatisation of both lungs with some collapse, but very little internal ecchymosis.)

9. I will now occupy the rest of our time to-day in describing to you an interesting and somewhat unusual case which we have in John ward, No. 8 bed, in a patient who was under my care five years ago (December, 1892) in the same ward. I lost sight of him from 1892 till about three weeks ago, when he reappeared in Philip ward. On taking over the clinical wards I had him transferred here for the interest of the case. We have, therefore, three reports: (1) this which I have in my own note-book for 1892; (2) the report made on his admission in Philip ward three weeks ago; and (3) the report made the day before yesterday in John ward.

He is about 42 years of age. He seems to have been strong and healthy in youth. Possibly his mother died of phthisis—we cannot ascertain certainly,—and he lost a sister who may also have been phthisical. He went to sea when he was a boy of fifteen. Four years later he joined the army and was sent to India, where he saw service. Like almost every one who goes there he had malarial fever, but did not suffer from dysentery nor from any other form of tropical disease. Unfortunately he contracted a disease which is as common in the tropics as here, and is a terrible scourge in the Indian army—namely, syphilis. He had a chancre, a sore throat, and a rash upon the skin. He was treated by the regimental surgeon, no doubt with mercury, and appeared to be cured. He seems to have continued well until he again enlisted after he had served his time, and went out to Egypt. While he was in garrison at Cairo he became subject to fits, the first of which occurred in 1891. Then after several months' interval he had fresh fits, which became more frequent, and so he was invalided home, and finally dismissed from the army as incurable. However, he managed to get employment in the arsenal at Woolwich, and

has been working there up to the time of admission. He had no signs of pulmonary disease five years ago, but last winter he had a cough; on his coming in this time he has signs of consolidation and catarrh at the left apex, both in front and behind; so that there is no doubt he has chronic phthisis. That has occurred, you see, long after the syphilis which he contracted in India, and the consequent epilepsy in Egypt, and probably there is no connection between the two. Careful observers are agreed that there is no such thing as syphilitic phthisis; phthisis is chronic tuberculosis of the lungs and that only. Some cases of phthisis are more hæmorrhagic than others, and some are more inflammatory; in some tuberculosis is more acute, in others there is more caseous pneumonia, or bronchitis, or pleurisy,—but all are varieties of one and the same disease. There is, however, a true syphilitic disease of the lung which may simulate phthisis. It was recognised by Dr. Wilks in this country, by Gubler in Germany, and by Lanceraux in France. I have myself seen five cases of undoubted syphilis of the lung—gummatous disease, with peribronchitis and consolidation. The nature of the disease in some of them was proved by symptoms during life, and the disappearance of the symptoms under antisyphilitic treatment. In others at the post-mortem examination there has been absolute demonstration of gummata in the lungs. Many years ago I showed one of the cases at the Pathological Society (1877) with a gumma in the lung, and one from a private case of mine is in the museum. It shows gummatous inflammation of the lungs with ulceration of the trachea and bronchi. Such cases, however, are very rare, and they are difficult to diagnose. The symptoms may closely resemble those of chronic " fibroid " phthisis, but they are not so confined to the apex of the lung, and they sometimes affect only one lung. They are also accompanied by induration of the glands, which you do not see in tubercular phthisis, and you may generally find some other sign of syphilis. Moreover, the sputa do not contain the bacilli of tubercle. It is important to recognise these cases, because they may be cured by proper treatment, whereas antituberculous treatment will only do them harm. Unfortunately there can be no doubt that our patient has phthisis.

Shortly before he came under my care five years

ago—before he developed the cough—but when he had already become the subject of syphilitic eclampsia, he complained that he could not feel properly in some parts of his body, especially on his face, that he could not walk well, and that he had a bad headache. We found that there was real loss of power in his lower limbs. His headache keeps him awake at night, and therefore is probably due to some serious disease such as tumour or meningitis, syphilitic or otherwise.

We have, then, three things to consider—paraplegia, anæsthesia, and pains in the head. We find that his paraplegia is spastic, not atrophic, and that it has its seat in a lesion of the spinal cord, not in the muscles themselves. The anæsthesia is in some respects a more important symptom. As you know, in the paralysis which Charcot called hemiplegia vulgaris, motion is more affected than sensation; though there is loss of sensation, it is much less pronounced than the motor weakness; and what is true of hemiplegia is also true of paraplegia. The exceptions are—(1) the functional or hysterical hemiplegia, which occurs in women, and sometimes in men. Here anæsthesia affects the whole of the skin up to the middle line, and there is much more anæsthesia in proportion to the loss of power. (2) The other condition in which anæsthesia is prominent is due to syphilitic lesions. When you find patches of anæsthesia, as in the present patient, in cases of disease of the nervous centres, always think of syphilis. But his syphilis has not protected him from phthisis; it does not ensure that he has not got tumour of the brain, or some other cause for fits or loss of power, and anæsthesia. You must not assume because a person has had syphilis that every symptom afterwards is due to it.

The paraplegia is not complete, because he can walk and can move his legs in bed; indeed, it is doubtful if the right leg can be called paraplegic at all. The left one he drags, with his left heel raised as in talipes equinus—a variety of spastic gait, due to tonic contraction of the muscles of the calf. When examined in bed the knee-jerks are found to be more active on the left side than on the right. On both sides some ankle-clonus can be obtained; it is well marked on the left side, only slightly on the right. There is no anæsthesia ~f the skin of the legs, nor of the trunk or the

There are no pelvic symptoms, i.e. no bedsores over the sacrum, incontinence or retention of urine, incontinence of fæces, or affections of the genitals, whether loss of erectile power or priapism. These four symptoms often occur together, and none of them are present in this case.

His arms are quite unaffected, and the muscles of the trunk are normal. He has slight aortic regurgitation, which has, I believe, come on since I made my private notes of his case five years ago. It is probably due to syphilitic atheroma, and produces no symptoms at present.

We now come to the face. Both in 1892 and 1897 we found that the loss of feeling is on the same side as the loss of power in the leg; we also found that the line along which there is anæsthesia is well defined, running down the middle line along the forehead and nose, affecting the cheek and the eyelids and conjunctiva, so that he can allow you to touch it without closing his orbicularis. The three forms of sensation—to touch, to temperature, and to pain—are absent from the anæsthetic portion. The area of anæsthesia comes down to the mouth and upper lip, and the mucous membrane of the upper lip and the palate are affected. But the chin and lower jaw and lip are not anæsthetic; so the sensory branches of the third division of the fifth nerve have escaped. By the plate which I pass round you will be reminded of the exact distribution of the trifacial nerve.

Beside this anæsthesia, there is also motor palsy of the muscular branches of the fifth nerve.

He is a thin man and a good deal wasted, so that one might at first sight suppose that the hollowness of the face is due to this. But if you put the patient in a good light, you see at once the difference between the two sides. And if you put your fingers on the temporal fossæ and the ascending rami of the lower jaw, on the right side you will feel the masseter and the temporalis, while on the left side they are gone. If you ask him to shut his mouth and feel the muscles of the right side contract, the difference is still more striking. The contraction of the right internal pterygoid also can be felt by thrusting the fingers up under the ramus, as Mr. Fitzhugh showed me. If you tell the patient to bring his lower jaw forward, so that the lower teeth project in front of the upper, he tries to do it, but the incisors of his lower jaw are shunted

over to the left side. If the left external pterygoid pulled with the right as it should do, the result would be movement in a direct line forwards, but inasmuch as the left one does not act at all, the jaw is moved over to the left side. We have therefore complete evidence of paralysis of the muscles of mastication supplied by the motor division of the fifth nerve. I think the buccal branch of the fifth nerve is chiefly distributed to the mucous membrane, so that you would not expect the buccinator muscle to be so much affected as in Bell's palsy.

Is there anything to add to this account of the patient's condition? The chief point is to look for signs of syphilis. We know that he has suffered from eclampsia, and years ago had a chancre, but it is important to make sure by something apart from his own statement, that he has really had syphilis. This evidence we find on examining the eyes. The iris on the left side has formed adhesions with the capsule of the lens behind it; therefore it does not dilate when you put atropine into both eyes. Moreover, the margin of the iris is not quite round. There can be no doubt, then, of syphilitic iritis. Notice that there is in this case no paralysis of the ocular muscles, no ptosis, and no squinting—conditions frequent in syphilitic paralysis. On looking at the optic discs it is found that there is a patch of pigment in the fundus of one side, that both the optic discs have undergone optic neuritis, and one of them is passing into optic atrophy. This process had begun when he was in Philip ward five years ago, and now it has increased, so that the sight of one eye is almost gone, and that of the other is imperfect.

The diagnosis of disease in any part of the body aims at two things, namely, to discover the nature, including the origin, of the lesion and its seat; or, as the late Sir Russell Reynolds put it, to find out where it is and what it is. Sometimes to answer one of these questions is easier than to answer the other. Here, for instance, there can be no doubt that our patient's disease is of syphilitic origin; he had sudden severe pains in the head which disappeared under mercurials, epileptic fits, adhesions of the iris, and anæsthetic areas, to say nothing of the man's own statement that he was treated for syphilis when in India.

Next, what is the seat and exact nature of the lesion? Let us first take the paraplegia. It is only slight in degree, and has lasted for five years without getting much worse; so that it cannot be due to acute myelitis, or to compression of the cord or complete transverse myelitis; it must be due to some partial sclerotic change, and the fact of the spastic symptoms which I have described, fixes that change in the lateral columns, the crossed pyramidal tracts of the spinal cord. His legs are thin because he is in bad health, but the muscles are not more wasted than is accounted for by disuse. You know that primary lateral sclerosis is very rare indeed, so that we may assume that here it is due to some lesion higher up, to which the descending lateral sclerosis is secondary; and this primary lesion must be above the origin of the cervical and brachial plexus.

Now for the face. There the remarkable thing is that while two thirds of the sensory branch and the whole of the motor branch are implicated, the sensory part of the third division has escaped. This ought to help us in detecting the seat. The symptoms of muscular atrophy show that the lesion is either in the motor nerves or in the muscles. No other muscles are affected, and those only which are supplied by a single nerve, so that the atrophy is certainly not primary in the muscles but secondary to peripheral neuritis. There must be a lesion either at the root of the trifacial nerve or in its trunk. The latter condition—syphilitic neuritis—is improbable, because there is no tenderness on pressure or neuralgia. Moreover, it is very unusual to see unilateral peripheral neuritis due to a general cause. The multiple neuritis due to syphilis, gout, diabetes, diphtheria, alcohol, or leprosy, is always or almost always symmetrical. Therefore I think the lesion is not in the nerve itself, but just in the root of the nerve. It cannot be above in the cortex or in the corpus striatum, because of the atrophy; it must be in the nuclei of origin, or just at the beginning of the nerve on one side of the pons. Now, you will remember that the nuclei of origin of the motor and sensory branches of the fifth are separate, the latter lying to the outer side of the former in the bulb. Therefore it would be easy to understand a nuclear lesion affecting the sensory part of the fifth without the muscles of mastication being affected. But it is very difficult to understand a lesion that would affect the motor nucleus, and only a part of the

sensory nucleus, leaving the rest intact. It seems to me far more likely that the lesion is situated at the superficial origin of the nerve where it comes off from the pons, and that it has destroyed the whole of the first and second trunks, and the motor part of the third. Whether it is a gumma or syphilitic meningitis I do not pretend to say; I believe it is one or other.

Now as to treatment and prognosis. If the patient had now come under us for the first time, I should have hoped to treat him effectually. There are two drugs on which we depend in the treatment of syphilis, iodide of potassium (or sodium) and mercury. Do not get into the habit of using them indiscriminately. Iodide of potassium has a wonderful effect upon gummata and upon all things allied to gummata,—periostitis, chronic meningitis, thickening of the fibrous tissue everywhere. Wherever, then, you find periostitis of the tibia, wherever you find gummata, wherever you find severe headache, or any evidence of pressure owing to inflammation of fibrous tissue, give your iodide, and give it freely and in large doses; you will find the gummata melt away, and the pain disappear, and you will cure the symptoms. But remember that you have not cured the syphilis; you must next put the patient under a course of mercury. Five years ago, accordingly, we gave iodide of potassium in rapidly increasing doses up to thirty grains three times a day. The result was very satisfactory; he speedily lost all those severe pains in his head, and he thought he felt better on the skin of his cheek, but I fear that was only fancy. He certainly walked better than he had before, and he went out of the hospital much improved in all respects. You must remember that was before any signs of phthisis appeared. Before he left the ward we put him upon perchloride of mercury, and he became so much stronger that he was able to work again until lately. There is now no reason for giving him iodide, but there is every reason for bringing him under the influence of mercury; syphilis is a slow disease, and must be treated with slow and long-continued remedies. In what form should we give the mercury? It really does not matter so long as you get the mercury into the system; you may give him Plummer's pill, or grey powder, or perchloride of mercury; or you may rub mercury into the skin, or fumigate him, or treat him by intra-muscular injections, or you may even inject mercury into a vein. I think the last two methods are quite unnecessary; certainly they ought not to be used in ordinary cases as is done in some parts of the Continent. Nor is there the least object except concealment in going to any foreign watering-place. We have ample experience in this country of the methods of treating by mercury. The method should be decided by the circumstances of each case. But your object is to mercurialise short of salivation; we do not now aim at eliminating the syphilis by the saliva, or by the sweat. Give it until there is slight tenderness of the gums; then give somewhat less, and when he is once under the drug give him small and long-continued doses. Does the presence of phthisis forbid our giving the mercury? I think not: at all events I believe iodide of potassium would be far more "depressing," *i.e.* would spoil his appetite, weaken his pulse, and make him despondent. He may have cod-liver oil and creasote or guaiacol at the same time. Still the long standing of the paralysis forbids our feeling great confidence in the result of treatment, and the phthisis is a serious complication.

Fatal Hæmorrhage from the Removal of Adenoid Vegetations.

—Schimiegelow ('Laryngoscope') gives the history of a case in the practice of a surgeon in which the operation was fatal. The surgeon had frequently operated successfully before. The patient was a boy æt. 12 years. There was nothing unusual in the case, except that the adenoids were very prominent, and that there were scrofulous glands in the neck. The operation was done without anæsthesia, and the ordinary Gottstein's curette was used. Without any warning, a sudden gush of arterial blood issued from mouth and nose. Tamponing was prompt, and intra-venous saline injections were administered, but in a few minutes the boy was dead. On *post-mortem* examination, the internal carotid artery was found to have been opened, just in front of its entrance into the carotid canal of the pars petrosa ossis temporis. The author supposes that swollen glands had pushed the vessel forward so that the pressure of the knife caused its rupture, for it was not cut.

The Canadian Practitioner, December, 1897.

A CLINICAL LECTURE

ON

CASES OF EPILEPSY AND OTHER CONVULSIVE DISORDERS OF THE NERVOUS SYSTEM.

Delivered at the West End Hospital for Diseases of the
Nervous System, December 7th, 1897,

By FLETCHER BEACH, M.B., F.R.C.P.,

Physician to the Hospital; Physician to the Chalfont
Colony for Epileptics; formerly Medical Superintendent
of the Darenth School for Imbecile Children.

PART I.

GENTLEMEN,—The subject of my lecture to-day is
an extensive one, so that I can only attempt to
give you some practical points concerning it which
may interest you.

Epilepsy is a disease of the nervous system in
which there is impairment or loss of consciousness,
and generally convulsions. Usually no marked
change can be seen after death in the brain by the
naked eye, or what is found is more the consequence
than the cause of the disease, and so the condition
is termed idiopathic or genuine epilepsy. It is a
functional, not an organic disease.

And first a few remarks on the *ætiology* of the
affection. The most important predisposing cause
is *hereditary taint*, which can be traced in rather
more than a third of the cases. The inherited
tendency may be direct or indirect; in the former
case the children of an epileptic are affected, in
the latter the children escape, but it appears in
their descendants. As an example of the direct
tendency the following may be cited.

G. B—, æt. 3½ years, has epileptic fits consisting
of turning outwards of the left eye, and spasmodic
movements of both arms. Sometimes he twitches
both arms in front of him, and sometimes throws
them above his head. They are momentary, and
the boy is said not to lose consciousness, but
reference to this point will be made later on. The
father has had epileptic fits for many years. The
mother used to have fits before marriage, and she
had one while pregnant with this child. In this
case both the parents are affected, and the child
has inherited the same affliction as that from which
the father and mother suffer.

In some cases the tendency is more indirect.
On questioning the patient you will discover either
in his direct or collateral relations epilepsy, insanity,
hysteria, indulgence in alcohol, chronic neuralgia,
eccentricity, or extreme nervousness. The trans-
formation of nervous affections into one another
is an interesting subject, and was worked out many
years ago by Moreau, of Tours, who in his
'Psychological Morbide' gave several examples
of the transformation of heredity taken from
pathology and history. He truly says, "we must
not look for a return of identical phenomena in
each generation. . . . A family, whose head has
died insane or epileptic, does not of necessity
consist of lunatics or epileptics, but the children
may be idiots, paralytics, or scrofulous." Trousseau
relates an interesting case of a gentleman who, when
sixty-four years of age, suffered from melancholia,
of which he was afterwards cured. His children
consisted of two sons and a daughter. The eldest
son was melancholy in temperament, but sound in
mind; the second had locomotor ataxy, and died
insane. A son of the latter, that is a grandson of
the father, was sound in mind, but had a child who
was an idiot. The daughter of the gentleman
first mentioned, who was weak in intelligence
and eccentric, had two sons, the elder of whom
died insane and paralysed, and the younger was
almost idiotic. The gentleman's sister became
insane when thirty years of age. She had a son
and a daughter; the son was afflicted with epilepsy,
and the daughter died insane, leaving a son who
was impaired in intellect.

Another predisposing cause is said to be *con-
sanguineous marriages*. I am sceptical on this
point. Years ago consanguineous marriages were
supposed to play an important part in the produc-
tion of idiocy and imbecility, but later researches
have shown that marriages of this kind do not
account for more than from 2 to 4 per cent. of
the cases, and in those children whose parents were
first cousins, there were other causes present quite
sufficient of themselves to produce the idiocy and
imbecility without the influence of consanguinity.
When both parents have an unstable nervous sys-
tem, there is great probability that the children
will be affected with some nervous disorder, and
so epileptic convulsions in the children may be the
consequence when the parents suffer from hysteria,
nervousness, or chronic neuralgia. There is no

necessity, however, for the parents to be first cousins to produce this effect. Any parents who previously had an unstable nervous system are quite as likely to have children suffering from some nervous affection as are the children of first cousins. Epilepsy seems to be more frequently transmitted through the mother than the father, and the female is more frequently affected than the male, the proportion according to Gowers being 114 to 100. My experience here agrees with this decision.

Age is another predisposing cause. Gowers thinks that three-quarters of the cases occur before twenty years of age, and nearly half between ten and twenty, most commencing at fourteen, fifteen, and sixteen. These numbers are borne out by my experience here, where the great majority of cases I have seen have been under twenty years of age. After twenty years the number gradually falls, but cases have been known to commence as late as seventy. It is curious that up to thirty years of age the females exceed the males, but after that age the proportion is reversed, and the disease occurs more frequently in males than females. It has been said that where there is a hereditary tendency epilepsy commences before twenty years of age; but Gowers asserts that inheritance plays an important part during the whole of life.

Other predisposing causes are *congenital defect of development of the brain*, as is seen in idiots and imbeciles. At Darenth quite one third of the cases suffered from epilepsy. *Defective nutrition of the body*, such as is met with in anæmia, scrofula, and rickets, also is an important predisposing cause. Both produce an instability of the nervous system, which predisposes to the production of epilepsy.

Of the exciting causes fright and anxiety are the most frequent. The convulsions that occur during dentition often persist, and become true epilepsy after the exciting cause has passed away. Injuries to the head, sunstroke, delayed menstruation, masturbation, and syphilis are some of the more common exciting causes. Epilepsy is also a frequent occurrence during convalescence from acute febrile disease, and especially after scarlet fever. In about one half of the cases analysed by the late Sir Russell Reynolds no exciting cause was discoverable.

The *premonitory symptoms* occur some hours or days before the onset of the fit, and consist chiefly of headache, giddiness, flashes of light before the eyes, sudden jerks of the limbs, and occasionally a mental change, evidenced by irritability and excitability, or, on the other hand, depression. In rare cases delusions have been noticed.

The *immediate premonitory symptom* is an aura, or warning. There are several kinds of these, and it will be well for us to glance shortly at them. They are only met with in half the cases; in the others, consciousness is so quickly lost that no aura is noticed. The importance of the aura is that it makes the patient aware that an attack is coming on, or, in scientific language, it makes him conscious of a molecular change and commencing discharge in the brain. The aura is also important inasmuch as it is the result of the nervous discharge; hence a study of it will give us a clue to the functional region in which the fit commences.

The aura may be motor, sensory (including the visceral and special senses), or psychical. It is sometimes difficult in idiopathic epilepsy, on account of the patient losing consciousness at an early period of the attack, to discover whether the aura was a motor or sensory one. Where there is organic disease, as in Jacksonian epilepsy, to which we shall afterwards refer, loss of consciousness does not occur, or occurs only at a late period, and then the patient will tell us that he feels on one side of the body a twitching or spasm of the thumb or hand, which passes up the arm to the shoulder and head, and then extends to the lower extremities. According to Gowers, the *motion or sensation* commences most frequently in the arm, less frequently in the face or leg, occasionally in the tongue, very rarely in the side of the trunk, and my experience here makes me agree with this statement. If the aura commences with a spasm, it is usually felt in the hand; if with a sensation, such as numbness or tingling, it commences in the thumb, fingers, palm, or wrist, and then the patient will tell you that he feels a creeping sensation in the thumb or hand, which gradually passes up the arm, and may pass to the head or legs before consciousness is lost. As a rule, all motor auræ commence in small muscles, such as the fingers or face or eyeballs, which are engaged in special movements, and so the auræ commence in special and pass to general actions. Frequently there

is only a sensation of giddiness, headache, or heaviness.

The most common *visceral* aura is that referred to the region of the pneumogastric nerve, and there is a feeling of pain in the pit of the stomach —the epigastric aura. Sometimes there is only a feeling of nausea, or a vague sensation, which passes up to the throat, and causes a feeling of choking. In other cases there is palpitation or a feeling of pain in the region of the heart.

Of the *special senses* the auditory auræ are common, and consist chiefly of ringing, whistling, hissing noises, or, on the other hand, of unusual stillness. Olfactory auræ are, as a rule, of unpleasant smells, and are not frequent. One of my patients has a smell like rotten eggs before the fit. Gustatory auræ are rare, and consist of a sour or metallic taste. Visual auræ are most common of all, and consist of sparks, flashes of light, and various colours, of which red is the most frequent. Occasionally a visual is associated with an auditory aura, and the reason for this will be explained further on. *Psychical auræ* often consist of intense fear or alarm, and the patient has a frightened look. In other cases the aura is what Dr. Hughlings Jackson calls a "dreamy state." In others, again, there are changes of temper, and the patient becomes irritable or peevish before the fit; there is failure of memory and slowness of ideas, or, on the other hand, a gay and joyous feeling. In rare cases there are hallucinations and illusions.

Very rarely there is what the French call a *procursive* aura, and the patient begins to run forward, and then falls in a fit, or turns himself round and round previously to the fit. Bourneville gives a good description of it in his ' Recherches Cliniques et Thérapeutique' for 1888, and I had a case of the kind under my care at Darenth. We always knew when a fit was coming on by seeing him suddenly start up and run forward.

It is not my intention to describe to you the classical fit, the *epilepsia gravior* or *haut mal*, consisting of loss of consciousness and tonic spasm, which lasts for a maximum period of forty seconds, followed by clonic spasms for a space of two minutes, and then complete stupor; but to allude to the varieties of epilepsy which do not follow in their symptoms those briefly described.

Before doing so it is necessary to delineate the *epilepsia minor* or *petit mal*, in which there is impairment or loss of consciousness, but no convulsions. The patient may be engaged in conversation at the time; while speaking he becomes unconscious, and there is a pause for a few seconds, at the end of which he resumes his conversation, and the sentence is finished. At other times there is a feeling of faintness with some confusion of mind, but this is so slight that it is not recognised by the patient's friends. In some cases there is a warning sensation before the loss of consciousness, and hence these attacks are called by their friends "sensations." In slight cases there may be simply pallor of the face or momentary giddiness with a short period of unconsciousness, or one of the auræ previously described with transient unconsciousness may constitute the fit. These patients which I now show you are examples of the minor form of fit. Gowers mentions no less than seventeen kinds of *petit mal*, but according to him no less than half the cases are characterised by "sudden momentary unconsciousness, fainting, or sleepiness without warning and giddiness." It is necessary, then, to be aware of these cases, so as to be on our guard, and recognise the true nature of the disease.

Varieties.—From what has been already said it appears that there are several forms of minor fits or *petit mal*. As regards the *epilepsia gravior* or *haut mal*, in some cases there is only a tonic or clonic spasm, and not both of them. In both cases the fits are not so severe as usual; in the former case, after unconsciousness, the epileptic falls with tonic spasm for a few seconds, and then recovers. In the latter the fits are not general, but limited to the hand or arm. They are not common in " genuine " epilepsy, but are often seen in cases of organic brain disease. Occasionally there is a clonic spasm of a less severe character added to the tonic spasm, instead of taking the place of it as in the classical form.

I spoke just now of the procursive aura which precedes the epileptic fit, but there are cases on record in which a *procursive act* takes the place of a fit. Bourneville relates a case in which the patient ran forward in a straight line ; generally there was no preceding aura, no epileptic cry, and no tonic spasm. It seemed as if the clonic spasm was replaced by the running, and the return to

consciousness was prompt, without coma and without involuntary passage of urine. In some cases there are hundreds of attacks during the twenty-four hours, or the attacks may be prolonged for several days. I have had patients under my care at Darenth who have had between 1000 and 2000 fits before the return to consciousness. The fits are not continuous, but after a short space of time, about five minutes after the cessation of the last clonic convulsion, a fresh fit commences, and so on. The patient is unconscious during the whole of the time, and the temperature rises to 105° or 107°. This condition is called the "status epilepticus." Then there are cases of so-called "masked epilepsy" in which there is incomplete loss of consciousness with some automatic action. Trousseau relates the case of an amateur violinist who whilst playing had a fit. He went on playing during the attack, although he was unconscious of everything around him, and could neither see nor hear those he was accompanying, and yet he played in perfect time. This form is a variety of the minor fit or *petit mal.*

Fits of a reflex character due to irritation of a scar or of a foreign body in the nose are occasionally seen. These are more of the nature of convulsions, but may be conveniently referred to now. In these cases what is called an epileptogenous zone has been produced. You are no doubt aware of the experiments made by Brown-Séquard on guinea-pigs, with the idea of determining the nature of epilepsy. It was found that after hemisection of the spinal cord, pinching the skin of the face and neck on the same side as the injury was always followed by a fit. The part of the skin which, when irritated, causes an epileptic attack, Brown-Séquard called the epileptogenous zone. It is bounded by the four following lines: "One uniting the ear to the eye; a second from the eye to the middle of the length of the inferior maxillary bone; a third, which unites the inferior extremity of the second line to the angle of the inferior jaw; a fourth, which forms a half circle and goes from this angle to the ear, and the convexity of which approaches the shoulder." This is the area of distribution of the trigeminal and occipital nerves. It was also found that the progeny of these guinea-pigs were epileptic. Gentle tickling or even touching the skin of the epileptogenous zone was sufficient in some

cases to produce the fit; but severe irritation, such as burning or cutting the skin, would not cause it, and would even arrest an attack that had commenced.

There are three cases on record of fits following a touch on the head in the human subject; one recorded by Dunsmore in 1874, one by Hughlings Jackson in 1887, and one by Harris in August of the year 1897. The cases were all boys. Dunsmore's case was partially paralysed on the right side, Jackson's on the left, but in Harris's no paralysis was noticed. In the two first, fits could be produced by touching the head during sleep, and in all of them it occurred if the patient was unaware that he was going to be touched. In Jackson's case simply flicking the face with a handkerchief produced an attack. The boy turned red, looked vacant, respiration stopped, his eyes were turned to one side, and he would have fallen to the ground if he had not been held up by his father. The fit lasted only a few seconds, and was therefore slight, as were those of the other cases.

An important point was that in all the cases the sudden falls on touching the epileptogenous zone became less numerous or ceased as soon as ordinary epileptic fits supervened. Jackson's case is now under the care of my colleague Dr. Savill, who informs me the epileptogenous zone has now disappeared.

I should have mentioned to you previously that sometimes the attack comes on at night, and a patient who has before been healthy will complain in the morning of headache, or of being stupid and confused. You should then inquire whether there has been an involuntary escape of urine or fæces, whether the tongue has been bitten, and examine the patient to see if there are small ecchymoses in the skin. If these are found, you may be certain that the patient has had a fit. These facts are important from a practical point of view.

The symptoms after the epileptic fit is over are various. Sometimes the patient recovers in about a quarter of an hour, and goes on with his work. At other times he does not fully gain consciousness for an hour, and is then very irritable. In other cases there is temporary paralysis, and even aphasia after convulsions on one side, due no doubt to exhaustion of the nerve elements. I have reported one case of temporary aphasia after severe fits, and I saw numerous cases at Darenth of temporary

paralysis after fits. Various automatic actions occur not only after minor fits, but occasionally after severe ones. The patient will undress himself, strike a bystander, make water in public, put things in his pocket which do not belong to him, and make obscene remarks, and when he comes to himself he has not the slightest idea of what he has done. One of my patients during her fit goes on with what she is doing, and when she recovers consciousness she finds the work done.

In some cases a real attack of mania occurs, and the patient becomes violent and homicidal, or has various hallucinations or illusions. It is during this condition that so many motiveless and atrocious crimes have been perpetrated, and the occurrence is of much medico-legal interest, as the patient is not responsible for his actions. When the fits are frequent and have lasted for a long time, dementia and idiocy will be the consequence. The patient I now show you has impaired intellect. The whole subject of the relation of epilepsy to insanity is very interesting, but I have no time to go into it now as it would require a lecture to itself.

Before going into the pathology of epilepsy, it will be necessary to describe to you what is known as *Jacksonian epilepsy*. This affection was first described by Bravais, but Dr. Hughlings Jackson fully investigated it, and his name has been connected with it. The convulsions in this disease are *partial*, and consist of unilateral spasm in the hand, face, or foot, and are classified by Hughlings Jackson as monospasm when one arm or part of the body is affected, or hemispasm where it affects one half of the body. The spasm always progresses in a definite order; thus when it begins in the face, the muscles of the arm are next affected, and those of the leg last; when it begins in the muscles of the hand (the most common form) those of the face are next invaded, and those of the leg last; and when it begins in the leg, those of the arm are next affected, and those of the face last. The reason for this progression will be easily explained when we come to speak of the pathology or morbid physiology of the disease. Consciousness is retained throughout the attack, or is lost at a late period. It is met with very often in children, and is due to some coarse disease, commonly a gumma; or to hereditary syphilitic deposit of the brain cortex or its neighbourhood. The convul-

sions which supervene upon the spastic hemiplegia of childhood due to unilateral atrophy of the brain are at their commencement partial in character. I have two cases here which illustrate this disease very well. I am indebted for the first to my colleague Dr. Savill, and for the second to my colleague Dr. de Watteville.

(*To be continued.*)

New Theory of Cheyne-Stokes Respiration.—In a clinical lecture at the Brompton Hospital, Dr. Maguire stated that not even Felehne's view of the pathology of this condition was satisfactory. He showed that in disease, great depression of the cerebral higher centres was an invariable accompaniment, that in health the phenomenon occasionally occurred in adults during deep sleep, when the higher cerebral control was relaxed; very frequently during sleep in infants and idiots, in whom the cerebral controlling apparatus was imperfectly developed. He said that there was evidence to show that the respiratory centre in the medulla was controlled and kept in balance by a higher cerebral mechanism, and asserted that yawning and involuntary sighing were instances of irregular action of the respiratory centre when relieved of control by exhaustion or depression of the higher centres. He related experiments which proved that removal of the cerebral hemispheres produced Cheyne-Stokes respiration in the frog. It was shown also that lower centres when relieved from control, or when exhausted, were prone to show in their action irregularity of rhythm. Dr. Maguire therefore concluded that Cheyne-Stokes respiration is caused by a stormy unbalanced action of the respiratory centre, due to a depressed vitality of itself or of its higher controlling mechanism.

Ichthyol in Gastro-intestinal Diseases.—
Lange recommends a pill of $1\frac{1}{2}$ grains of ichthyol every hour or two in all severe cases of acute intestinal catarrh, also in all cases of chronic catarrh of the rectum and hæmorrhoids in which there is a great tendency to tympanites with foul evacuations. He states that this treatment is very efficacious, and he has never known it to give rise to anything worse than eructations.—*Allgemeine medicinische Central-Zeitung.*

On the Numeration of the Leucocytes of the Blood as a means of Diagnosis in Diseases of the Digestive Organs.*

BY

GEORGE HERSCHELL, M.D.Lond.

GENTLEMEN,—The point which I wish to impress upon you this evening is the great assistance which we may derive in the differential diagnosis of some of the affections of the digestive organs from a simple count of the white corpuscles of the blood. Although the numeration of the red corpuscles is at the present day performed as a matter of course in the daily practice of our profession, that of the leucocytes has suffered unmerited neglect, taking into consideration the fact that the information we can gain from doing so is certainly of use in a far greater number of affections.

Medical men may be roughly divided into two classes — those who spend their lives in the scientific research, and those who are actively engaged in the actual practice of medicine; and it is the duty of those of us who belong to the latter to seize on any facts which appear to be likely to be useful to us, and attempt to make use of them in the daily struggle with disease — that is, if we aim at practising our profession in the best possible manner, and giving our patients the advantages of the latest knowledge. Such an enormous amount of data have during the last few years been accumulated with respect to the leucocytes of the blood, that I venture to think that the time has now arrived when we should attempt to utilise them in the routine of our daily work.

In my opinion the best and simplest apparatus for counting the white corpuscles of the blood is that of Thoma-Zeiss, used with a diluting fluid consisting of one third of one per cent. solution of glacial acetic acid. This destroys the red corpuscles and renders the white ones visible. As you are all familiar with this apparatus, I will only trespass on your time in describing a modification of using it suggested by Dr. Franklin White, of Boston,

* A Paper read before the West Kent Medico-Chirurgical Society on December 3rd, 1897.

which considerably shortens the time occupied in the count. The counting chamber of the Thoma-Zeiss apparatus has at its centre a ruled space of one millimetre in area divided into 400 squares. In making the count of the leucocytes one is directed to examine two drops of the diluted blood in succession, and count the number which is found in the whole of this area each time. The equivalent of this may be done at one operation if you have your eye-piece fitted with a square diaphragm of such a size that, using a No. 1 eye-piece and a No. 5 Leitz objective, the field disclosed will contain exactly 100 squares, or one quarter of the ruled-off area. It necessarily follows that if you count the number of corpuscles in eight of these square fields taken in succession across the counting chamber, you will have accomplished exactly the same thing as if you had taken two drops and counted the corpuscles in the ruled area twice. And as you are not depending upon the lines ruled on the counting chamber, but count the whole number of corpuscles appearing in the square field, you are enabled to utilise the part of the counting chamber lying outside the ruled squares—a great advantage, as the lines are always difficult to see. Baker, of Holborn, who made my diaphragm for me, is prepared to fit one to any microscope which may be sent him, at a very small cost.

Before we can learn anything useful to us from the numeration of the white corpuscles, we must have a distinct idea of their number in health, and under what conditions variations may occur. I shall therefore commence by giving you a very brief résumé of what we actually know with reference to these matters.

Normal number of white corpuscles.—In a healthy adult there are approximately 7500 per cubic millimetre—sometimes more, and sometimes less. The amount in any particular individual will vary with the general level at which nutrition is maintained. The better nourished a man is, the higher will be his leucocyte count. Thus 5000 and 9000 white corpuscles per cubic millimetre might be quite consistent with perfect health in two persons respectively—the former of poor physique, taking a minimum amount of food and insufficient exercise, whilst the latter was a beef-fed athlete.

Although it is now generally recognised that the leucocytes in the blood are of at least four kinds,

yet for practical purposes we need only take into consideration two of them—the lymphocytes and the polymorphonuclear white corpuscles. The former, which are now looked upon as the younger corpuscles, form about 25 per cent. of the white corpuscles ; whilst the latter, the older or adult corpuscles, practically form the remainder. The lymphocytes are chiefly of clinical value in chlorosis, leucæmia, and some of the diseases peculiar to children, but the polymorphonuclear leucocytes can give us a great deal of information as to the nutrition of the individual.

But what I wish to point out to you this evening is the information which we may derive by simply counting the number of leucocytes without reference to their kind—in the first instance at any rate, —since if we eliminate the diseases mentioned, any increase in the number of leucocytes will almost always be either in all the varieties in proportion, or in the polymorphonuclear ones alone.

Increase in the number of these corpuscles is termed *leucocytosis*, and does not necessarily mean an absolute increase in their number in the blood, but that there is a relative increase in the number present in the peripheral capillaries.

We may divide leucocytosis into two groups, *digestion* or *normal leucocytosis*, and *permanent or pathological leucocytosis*.

In a healthy human being, an ordinary mixed meal is followed in from two to three hours by an increase of about 3000 per cubic millimetre on his normal count. This is called *digestion leucocytosis*, and depends upon the absorption of the products of digestion from the stomach and intestines. In estimating its presence or absence we must always bear in mind the normal count of the individual, if the total number counted does not exceed 13,000. For whilst in a badly-nourished patient whose leucocytes averaged 5000, 8000 would show that digestion leucocytosis was normal, the same number in a man whose normal count was 10,000 would mean that the leucocytes were absolutely in defect. But since we hardly ever meet with a normal count above 10,000, we may take all figures above this + 3000 as indicating leucocytosis, without troubling to obtain the normal count.

In digestion leucocytosis the lymphocytes and the polymorphonuclear corpuscles are increased in proportion. In all the pathological leucocytoses

which we shall study to-night, the increase is chiefly in the polymorphonuclear ones.

We may learn a great deal from the digestion leucocytosis.

1. It may be absent. It is usually absent in cancer of the stomach. It is generally present in ulcer. When we find an absence of the normal digestion leucocytosis, we know that there is some condition present which materially interferes with the absorption of food products from the alimentary canal.

2. It may be late, and instead of coming on a couple of hours after a meal, it may be four or five. This tells us that the digestive processes are unduly retarded. We meet with such a condition in atonically dilated stomachs, which do not empty themselves into the duodenum until long after they should do.

When leucocytosis occurs at other times besides the digestive period—that is to say, when the blood constantly contains more than its normal count of leucocytes, we call it *pathological leucocytosis*. In order to eliminate the possible error of digestion leucocytosis, we should always take the blood count either just before or after a meal, or before breakfast. We must also not forget that if the digestive processes are normal in an individual who has permanent increase in the white corpuscles, the ordinary digestion leucocytosis will be added on to this after meals in the usual way. As a rule we do not trouble to use the term *pathological* when we talk about leucocytosis. This is always meant unless we specify *digestion leucocytosis*.

The main conditions under which leucocytosis may occur are hæmorrhage, inflammation, certain poisons, and malignant disease. We shall take these in order.

Hæmorrhage.—A hæmorrhage of any extent is followed within an hour or two by a considerable leucocytosis. This persists for from one to three days and then passes off.

Inflammation.—We know that all inflammation is the local expression of the struggle of the organism with some septic material introduced or in contact with some of its tissues. The leucocytosis produced appears to vary with the resisting power of the organism. If the poison is slight and the resisting power good, the resulting leucocytosis will be slight. If the dose is more serious it will be greater. If the dose of the poison is so

great that the organism is unable to struggle against it, leucocytosis will be absent.   So we see that a slight leucocytosis may mean either that the affection is a mild one or that it is mortal.   Leucocytosis is practically present in all inflammatory conditions—slight when it is localised, and severe when it is diffused.

Toxic leucocytosis.—It has been experimentally proved that leucocytosis follows—

1. The injection of certain organic extracts, peptone and nuclein.   For instance, the daily count of a patient on whom I am injecting daily 2 c.c. of a 1 per cent. nucleinic acid solution is 24,000.

2. It is present practically in all the acute infectious fevers except typhoid, influenza, rötheln, and is absent in malaria and all forms of tubercle.

3. Certain affections probably due to some toxic agent, such as gout, acute yellow atrophy of the liver.

4. Gastro-intestinal affections in which we may presume there is some absorption of toxines from the alimentary canal.

Let us now see if we can apply these facts to cases of disease of the digestive organs.

We will first of all take the *diseases of the stomach.*

Diseases of the stomach.—The affections of the stomach which we meet with most frequently in daily practice are ulcer, carcinoma, acute gastritis, chronic gastritis, and the functional derangements of motor power, secretion, and sensibility; the commonest of these being atony and dilatation of the stomach, hyperchlorhydria, and gastralgia. Out of this list, leucocytosis is present in acute gastritis, slightly in hyperchlorhydria, and in about one third of cases of cancer of the stomach, but more frequently when metastasis has occurred to other organs.

We are therefore justified in drawing the following practical deductions :

1. There is a well-known form of typhoid which commences with symptoms very like acute gastritis. There is frequent vomiting, which may continue for several days and be followed by diarrhœa.   In process of time, if the case were gastritis we should no doubt be able to exclude typhoid by the subsequent course of the temperature ; but by making a count of the leucocytes we are able to do so from the very beginning if we find them markedly increased, as this never, as far as we know, occurs

in typhoid fever unless there is some inflammatory complication ; and this is all the more valuable to us as Widal's clump reaction does not appear to be available before the fifth day after the patient has taken to his bed.

2. In both ulcer of the stomach and hyperchlorhydria there may be acute pain coming on after food.   In the former affection there is practically never any leucocytosis unless there has recently been a hæmorrhage ; in hyperchlorhydria, on the other hand, there is usually a certain degree.   If, then, in a case presenting the symptoms which suggest ulcer of the stomach we find a marked leucocytosis, we may conclude that there is some other affection, possibly hyperchlorhydria, present.

3. As regards the differentiation between a malignant and non-malignant ulcer, the finding of leucocytosis would suggest the former.   If in addition there was an absence of digestion leucocytosis, our suspicion would be confirmed.

4. It often happens in practice that the problem before us is whether a patient is suffering from advanced chronic gastritis with atrophy of the secreting tissues of the stomach, or from some malignant affection.   In the former we shall probably find a deficiency of white corpuscles (leucopenia), and that the digestion leucocytosis is delayed ; in cancer that there is a distinct leucocytosis, and that the digestion leucocytosis is absent.   •

5. In simple atonic dilatation of the stomach, leucocytosis is usually absent and digestion leucocytosis delayed.

·   If we find the physical signs of a dilated stomach associated with marked leucocytosis, we are justified in strongly suspecting malignant stricture of the pylorus.

Diseases of the liver.—1. *Jaundice.*—The presence of leucocytosis would suggest that the jaundice was associated with—

    a. Malignant disease.

    b. Abscess.

    c. Cholangitis.

2. *Gall-stones.*—If the patient is passing a gall-stone simply, there will be no leucocytosis.   If there is leucocytosis, then the patient probably has either—

    a. Peritonitis,

    b. Appendicitis.

    c. Suppurative cholangitis.

Intestines.—I have left until last the very great assistance which the numeration of the white corpuscles gives us in estimating the gravity of a case of appendicitis. And I will go so far as to say that if this were the only thing it could be used for, it would be worth the while of every medical man to make himself acquainted with the technique for this purpose alone.

If any of you will read a few of the recorded cases of appendicitis, with the knowledge of the bearings of leucocytosis you now have, you cannot fail to be struck with the different results which would have occurred if a blood count had been made from day to day. First of all as to the matter of diagnosis. Many cases have been reported where it was apparently impossible to decide whether the physician had to do with a case of appendicitis or of typhoid. Treves has reported several such in the ' Medico-Chirurgical Transactions,' 1888, vol. lxxi, p. 165. Any of you here would now exclude typhoid in a few minutes by the absence of leucocytosis.

The principal affections which we have to bear in mind in making a diagnosis of appendicitis are—

1. Colic.—*a.* Gall-stone colic.
    b. Renal colic.
    c. Simple colic from fæcal obstruction.
2. The pain of intestinal obstruction from mechanical causes such as intussusception or volvulus.
3. Ovarian neuralgia.
4. Pyosalpinx.
5. Typhoid.

In none of these will we find leucocytosis, except in gall-stone colic when associated with cholangitis or cholecystitis, renal colic when complicated with pyelitis or cystitis, and in pyosalpinx.

Therefore, if we can exclude these three, the presence of leucocytosis makes us practically certain that we have to deal with a case of appendicitis.

Following the law previously enunciated, the mildest and the severest cases of appendicitis produce no leucocytosis. That is to say, in the first the inflammation is not sufficient to produce it, and in the last the system cannot react to the overwhelming dose of poison thrown into the peritoneal cavity. Therefore, the absence of leucocytosis in a severe case, the diagnosis of which

has been made by the ordinary clinical methods, is of bad omen.

A leucocytosis which increases from day to day is a bad sign, as it shows that the disease is spreading, and the surgeon should operate without delay, although there may be no other symptoms pointing to the fact that the patient is worse.

In an ordinary mild case the leucocytosis usually increases for the first two or three days, and then subsides as the abscess becomes localised and properly walled off.

When a considerable leucocytosis persists for several days without either diminishing or increasing, in a case which is otherwise doing well, it means that a large collection of pus is shut off from the general peritoneal cavity tolerably securely, but that it shows no tendency to be absorbed. These cases should be operated upon without further delay.

In conclusion, whilst thanking you for the attention you have given me, I may say I am painfully conscious that these few remarks which I have had the honour of making to you to-night form the merest and baldest sketch of a most interesting subject, but in the short time at my disposal it is impossible to do more than get a glimpse of the possibilities of this valuable method of physical examination. Gentlemen, I hope that what I have said may stimulate some of you to do further work in this direction, and that you will communicate your results to this Society on some future occasion.

Direct Transplantation of Muscles in the Treatment of Paralytic Deformity.

— In a large number of cases of infantile paralysis, involving the thighs, the tensor vaginæ femoris and the sartorius escape, the lower extremity becoming flexed and adducted. To overcome this deformity and utilise the sartorius, Goldthwait has five times attached its lower end to the tendon of the quadriceps femoris just above the patella. Three cases were improved, and two failed owing to the giving way of the sutures. The author also reports a case in which he attached the common extensor and tibialis anticus in the lower part of their course, to overcome deformity consequent upon tibialis anticus paralysis. —*Boston Med. and Surg Journ.*, November 11th, 1897.

DEMONSTRATION OF CASES AT CHARING CROSS HOSPITAL,

November 18th, 1897.　(Post-Graduate Course.)

BY

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Gastric Ulcer—Perforation—Operation.

OUR first case is a young woman æt. 27, a servant, who is the subject of a perforated gastric ulcer. The facts of the case are as follows :—She has suffered from dyspepsia for the last year or two, but since August the symptoms have become very much more acute, and three or four weeks back she had a violent attack of hæmatemesis. On the evening of Sunday week, i. e. twelve days ago, she was in the south of London on a visit, when she was suddenly taken with intense pain in the stomach, and was so collapsed that she had to be brought home in a cab, and put to bed, but was almost immediately brought to the hospital. I was sent for by the House Physician, and by the story which was told to me I agreed with him that it looked like a case of perforated gastric ulcer, and therefore called for my surgical colleague, Mr. Morgan, on my way to the hospital. On arrival we saw at once that it was a serious case. There were no particular physical signs, but the abdomen was very hard. I of course diagnosed gastric ulcer, and Mr. Morgan agreeing with that he opened the abdomen without delay. As regards the operation I need only say that he made a linear incision in the middle line, exposed the stomach, and the ulcer was found to be on the lesser curvature, in front. It was evidently a chronic ulcer, with indurated edges. Mr. Morgan did not actually sew the edges of the ulcer together, but doubled up the stomach wall across and sewed it together with silk. The abdomen was then washed out. There was no sign of peritonitis, as the operation was done so shortly after the accident. She has made good recovery from the operation, and is doing well. The operation was performed twelve days ago. For several days after the operation she was kept on rectal injections in the form of nutrient enemata, but for two days past she has been allowed to have a little nourishment by the stomach, which she perfectly retains, without pain, showing that the gastric wound has healed up. The interesting point from the medical point of view was the diagnosis. The symptoms seemed to point so plainly to perforation that we did not wait for the supervention of physical signs, and the results have justified our procedure. There has been only a very trifling rise of temperature since the operation, nor has there been any sickness since. I merely show you this case to-day as a striking instance of the extreme importance of early operation in gastric perforation. Mr. Morgan will, I hope, publish a full record of the case at a later date, with all the surgical details.

Right Hemiplegia in a Child.

This little girl is 9½ years of age, and has always been fairly healthy with the exception of measles some years ago. She has never had any rheumatism, but is stated to have had "growing pains." Six weeks ago she had a fall on the back of the head. On the 2nd of November she went to bed perfectly well. The next day she was going to school with her grandmother, when she suddenly fell down in the street in a sort of dazed condition, and when she was got home she was discovered to have a complete hemiplegia, the face also being affected, the paralysis being on the right side. As far as we can gather there was no convulsion. She remained in this apathetic dazed condition for some days, and has been in the same condition while she has been here. The clinical picture before us, therefore, is a complete right-sided hemiplegia, coming on apparently quite suddenly without convulsion; she had mental obscurity but no definite coma, the last being a comparatively uncommon affection in a child under these circumstances. You see that the right arm and leg are powerless, and that there is loss of reflex on the paralysed side. The mental condition now seems to be approaching the normal, and the eyes show nothing abnormal. The diagnosis of this case has been somewhat puzzling; it seems to be almost entirely a question

of probabilities. The natural questions which arise in a case like this are, first of all, what is the lesion? Is it on the surface of the brain, or is it intra-cerebral? In children a meningeal lesion is the more likely presumption in a case of this kind. The fall does not seem to have left any consequences; there is no sign of fracture of the skull, nor can we find any evidence of disease of the ear or abscess. Against anything meningeal also is the fact that there was no convulsion. On the other hand, in favour of the lesion being intra-cerebral we have the facts that the paralysis is very complete, just like an adult paralysis. If it had been a meningeal hæmorrhage or an inflammatory condition affecting the meninges, the hemiplegia would not be so complete and localised. It might then take the form of a diplegia or monoplegia, and probably the face would not be affected. It is therefore, on the whole, very probable that the symptoms were due to a lesion in the brain substance. If, then, it be an intra-cerebral lesion, what is the cause of it? Of course we have to consider the usual causes of such a lesion in the adult—hæmorrhage, thrombosis, embolism. As regards hæmorrhage, that is not probable here. In the first place, we can make out no cause for the hæmorrhage. There is no history of any increased vascularity of the brain, and there has been no acute illness lately, and there was no extreme coma when the hemiplegia came on. We can trace no history of syphilis, and we can find no record of any vascular disease or of a morbid blood state. Therefore hæmorrhage is probably out of account in this case. As regards thrombosis, there again the hemiplegia was very sudden, and we should expect the clotting of thrombosis to give rise to a more gradual onset of symptoms. There is no evidence, also, of any disease of the vascular wall. The most reasonable alternative we can fall back upon as a cause is embolism. When the child first came in there was a suspicion of a presystolic murmur at the apex, but there was some difference of opinion on this point, and there does not appear to be any such bruit at present. We have, therefore, no evidence of any marked disease of the valves of the heart, but there may have been some clotting there, and a fragment may have been carried to the middle cerebral artery and arrested there. Still the case is uncertain. The possibility

of it being a case of abscess in the brain was considered at one time, especially as it was recognised that ear disease might have given rise to the sudden onset by an abscess bursting. But the ears of this child, as I have said, are quite normal. It might be suggested that the case was tumour, but against that is the fact that the seizure was quite sudden, and there appear to have been no other symptoms such as vomiting, optic neuritis, or pain. Such a complete hemiplegia in a child is uncommon. At one time it was generally held that hæmorrhage in the brain did not occur in a child, but now it is recognised that children may have a condition very similar to adults. As regards the prognosis, most probably the condition will clear up. The little girl seems more cheerful and clear-headed, but the paralysis is at present as complete as before. You will notice the distinct paralysis of the lower half of the right side of the face. I may add also that there has been no rectal or bladder disturbance.

Malignant Disease of the Liver.

The next case presents nothing exceptional; it is a very straightforward case of malignant disease of the liver. The patient is a man 70 years of age, by occupation a cabdriver, who has enjoyed very fair health all his life. There is no history of previous illness, but for the last nine months he has been suffering from progressive loss of weight, cachexia, and gradual enlargement of his abdomen. When he was admitted his belly was considerably swollen, so that his measurement was forty inches round. There was a good deal of pain about the lower part of his abdomen. He was tapped on Saturday last, and fourteen pints of fluid were withdrawn. The fluid was straw-coloured, and the procedure relieved him a great deal. The liver can be felt to be distinctly nodular, but it is not yet very much enlarged; it is, however, hard and painful. Apparently his bile-ducts have escaped to a great extent, as there is no great amount of jaundice, though there must be some pressure upon his portal vein. He is only under palliative treatment, and keeping his bowels open. You will observe that the progress of the case is comparatively slow, and the malignant deposit appears to be confined at present to the liver alone.

A Case of Infantile Paralysis.

I now show you a tall, well-nourished boy æt. 16, the subject of infantile paralysis. The history is that when one and a half years of age he had measles, and the paralysis came on subsequently. You will see that the right scapula is very feebly developed, and the muscles of the right shoulder are practically gone, particularly the rhomboids, and the right deltoid, the only muscle of any size in the locality being the trapezius, for you will notice that he can shrug his shoulder well. In consequence of this defective development the head of the humerus is practically hanging quite loosely in the glenoid cavity. Moreover, the humerus on the right side is small compared with that on the other, and he cannot do any flexion at his elbow. He has some flexor power in his fingers, but has no power of pronation or supination on the right side. His humerus on the right side is naturally very fragile, and you will not be surprised at the patient's statement that he has broken it three times during his life. Notwithstanding the mal-development of the bone in thickness it has grown to a fair length, but the right hand is distinctly smaller than the other. An interesting fact is the atrophy of the inner edge of the scapula. He has been galvanised, &c., but we cannot do much for him. He writes very well with his left hand, mentally he is quite normal, and his legs are also as they should be.

Abductor Paralysis of Left Vocal Cord— Probable Aneurysm of the Arch of the Aorta.

This man, æt. 31, is a serjeant in the Royal Artillery, and is a very good illustration of the use of the laryngoscope in general medicine. He came to me in the throat department for an affection of his voice in June last. By the use of the laryngoscope we discovered that he had paralysis of the left vocal cord, quite an early abductor paralysis of it, i. e. he did not move his left cord outwards on deep inspiration, but it lay almost vertically. In paralysis of the left recurrent laryngeal·nerve associated with intra-thoracic pressure, the abductor movement of the cord is usually observed to be lost first. The commonest cause of this is, of course, pressure within the thorax, and the commonest cause of pressure in the thorax

is aneurysm. In examining his chest for aneurysm we thought there were possibly some signs of it, but they are not yet very obvious. He has some slight enlargement of the superficial thoracic veins, and there is a patch of dulness on the left side corresponding to the aorta, i. e. in the second space, and also some slight prominence about the sterno-clavicular articulation on that side. I took him into the hospital for the whole of September, and put him upon Tufnell's treatment, with laige doses of iodide of potassium. I got him down to about thirteen ounces of fluids and thirteen ounces of solids per diem, and he has been very courageous under the treatment. Certainly he does not seem to have got any worse since that time. If the disease be aneurysm we have got it in a very early stage. There is no specific history as far as I know.

NOTES.

Trephining as a Means of Relief in Cases of Respiratory Difficulty following Cerebral Lesions.

ONE of the most hopeless conditions which the general practitioner is called upon to face is that in which the subject of an apoplectic seizure begins to suffer from greater and greater respiratory difficulty, until it is evident that if something is not soon done for his relief death must speedily ensue. By apoplexy we mean that condition in which there has been a rupture of a blood-vessel somewhere in the skull cavity. As a rule, the physician finding himself in such a plight can do little else than stand by and wait till death ensues, although if the patient be very plethoric it is certainly a fact that free bleeding from a vein in the arm will often give great relief, and save or at least prolong life. Similar symptoms also arise from other cerebral injuries and lesions. Various measures have been suggested for the treatment of this state, many of them depending upon an erroneous idea of its cause, and others so radical in character as to be startling in their very suggestion. Perhaps one of the most radical of these was that of Victor Horsley, namely, compression or even ligation of the carotid

artery of the side of the brain in which the "artery of cerebral hæmorrhage" had ruptured. The various changes in posture which have been suggested are none of them adequate to meet the condition, except in so far as they equalise the circulation and prevent cerebral congestion, or stasis, by preventing any constriction of the neck by the collar or by faulty position of the head. If the hæmorrhage has taken place some hours before and there is reason to believe that it has ceased, and yet the respiration seems about to fail, great benefit may accrue from resorting to Laborde's rhythmic traction of the tongue or even the ordinary methods of artificial respiration.

The chief object of this editorial is, however, the calling of attention to the recently made suggestion that in a large proportion of cases the respiratory death from apoplexy results from pressure directly or indirectly exercised upon the most sensitive of all nervous centres, namely, that governing respiration. That failure of respiration is the most common cause of death in many injuries to the cranial contents is proved by experience, for the heart as a rule continues beating for some minutes after breathing ceases. This fact is particularly emphasised by Dr. J. Lacey Firth in the 'Bristol Medico-Chirurgical Review,' where in the course of an article he quotes a case of meningeal hæmorrhage, recorded by Hutchinson, in which the pulse continued five minutes after the respiration ceased ; and in another case of Fagge's in which the pressure of the cerebral abscess caused arrest of breathing with a continuance of the pulse-beat for ten minutes while artificial respiration was maintained. In another case the pulse lasted for thirty-five minutes. To quote more directly from Smith's article, he proceeds to state that Mr. Horsley mentions four cases he has met with, all of them being cases of tumour of the brain. In three of these the respiration ceased suddenly as the operation of trephining was being proceeded with, and in these the operation was quickly completed and tension relieved, when the power to breathe naturally returned. Mr. Horsley writes : " Cases of cerebral hæmorrhage, of cerebral tumour, and of depressed fracture, as well as cases of sudden and violent concussion, especially when applied in the occipital region, die from failure of respiration, and not, as is so often surmised, from failure of the heart." Mr. Horsley

also maintains that in those cases in which persons have been described as suddenly falling down dead in consequence of violent blows on the head, e. g. from a fist or cricket ball, or from an explosion, the fatal ending has resulted from respiratory paralysis, and might in some of them have been avoided by performing artificial respiration.

Macewen refers to two cases of respiratory paralysis. In one of these the heart continued to beat regularly for twenty-four hours after natural respiration had ceased. The source of pressure was a cerebral abscess. Mr. Jalland, of York, relates a case in which the breathing ceased when trephining was being proceeded with, and was not restored until pus was evacuated from a cerebral abscess. Another abscess case, where the heart continued beating for six hours, is reported from the Liverpool Royal Infirmary. Drs. Sawkins and Vallack, of Sydney, give notes of six cases of respiratory paralysis, all ultimately fatal. Two of their cases were of basal meningitis, with internal hydrocephalus ; the other four respectively of intra-ventricular hæmorrhage, cerebral hydatids, cerebellar tumour, and malignant tumour of the base of the skull ; the length of time during which the heart continued to beat varied from ten minutes to two hours.

Firth finally records a case of his own in which he resorted to trephining for the relief of the pressure, which, though indirectly exercised on the respiratory centre, seemed to be about to cause immediate death.

This patient was a male child two years of age, and was admitted to the hospital at 1 p.m., soon after a fall upon the head from a first-floor window. There was no scalp wound, but each parietal and temporal region was greatly swollen. The symmetrical swellings gave the head a very curious appearance. They were soft and boggy to palpation. The patient was very incompletely conscious, and very pallid. He lay for the most part still and quiet, but movements of each limb were made in response to cutaneous irritation. The pupils were equal and rather wide. They acted sluggishly to light. Vomiting occurred two or three times in the first two hours after admission. There was no hæmorrhage from the ears. The pulse was 120 ; the respiration normal. Two hours later the patient responded less to stimuli. The left pupil was perhaps a shade larger than the

right. The right arm and leg were moved fairly briskly on stimulation, but the left hardly at all. Soon after 6 p.m., *i. e.* rather over five hours after admission, respiration suddenly ceased, and cyanosis became marked. Artificial respiration was begun at once, as the heart was beating regularly and yielding a fair radial pulse. He had not an opportunity of seeing the patient between three and half-past nine. At ten o'clock, *i. e.* three and a half hours after the cessation of respiration, he removed, by trephining, two discs of bone from the right side of the skull. The first disc was over the anterior branch of the middle meningeal artery. The dura here seemed very tense, and was incised, but the brain did not bulge out. He attributed this to the small size of the aperture and the viscosity of the brain. The posterior disc was divided vertically by a fissured fracture of the skull. Through the uppermost exposed part of the fissured fracture a flake or two of brain substance had exuded. No removable source of pressure was discovered through either aperture.

The heart at the end of the operation was acting as strongly as at the beginning. Artificial respiration was kept up as well as possible during the operation, and for two hours longer. The artificial respiration was continued until the heart's action ceased, which was six hours and ten minutes after the onset of the paralysis of the respiratory centre. During the last hours of life transient systolic cardiac bruits were frequently heard.

The reason he trephined on the right side rather than on the left was that in his earlier observations there was a much weaker response of the left limbs to stimuli than of the right.

The post-mortem examination showed that if the other side had been chosen the pressure might have been much more effectually relieved.

Attention has been already called in a complimentary manner, in an article upon chloroform, to a valuable monograph on the Physiology and Pathology of the Cerebral Circulation by Mr. Leonard Hill, and from this and other researches it becomes evident that free trephining is to be practised in a certain number of seemingly hopeless cases of apoplexy or other cause of increased intra-cranial pressure. When the damage to the cranial contents is so great as to necessarily result in death, no good can come of the operation and no harm. In other instances it may save life, and

it should always be tried in cases in which respiration ceases and the practice of artificial respiration fails to give relief. During the performance of the operation, and after it until all hope is lost, artificial respiration by Sylvester's method should be constantly practised.—Leading article, *Therapeutic Gazette*, December, 1897.

The Abortive Treatment of Influenza with Calomel.

—According to the 'Presse Médicale,' this treatment, which is recommended by Felsenthal, is very simple, and consists in the systematic administration of calomel ('Revue Médicale,' December 8th). An experience during the first epidemic of influenza showed notably that calomel administered before the third day after the onset of the disease cut it short and checked the appearance of the ordinary complications of epidemic influenza.

The treatment is carried out by Felsenthal in the following manner: In all cases in which he sees the patient before the third day after the onset of the disease he begins by giving calomel; three grains in two doses to men, two grains and a half in three doses to women, and to children fifteen one-hundredths of a grain for every year of their age.

A very rapid amelioration follows the administration of this drug. From six to ten hours afterwards the very high temperature falls, the cephalalgia and the pains in the back diminish or completely disappear, the cough ceases, convalescence takes place, and the patient is completely cured, more frequently at the end of two or three days. There remains only a slight anorexia, which is easily overcome by the administration of some bitters.

In the large majority of cases the calomel is sufficient to bring about recovery. In certain cases, as adjuvants only, Felsenthal employs moist bandages around the thorax if there is not a decided fall of the fever; analgetics, such as antipyrine and phenacetine, if the pains persist; and sodium iodide if inflammatory symptoms pertaining to the respiratory tract exist. To men, Felsenthal is in the habit of giving, at the same time with the calomel, hot whisky or hot wine, in order to provoke abundant sweating.—*New York Med. Journ.*, Dec. 25th, 1897.

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A LECTURE

ON SOME

POINTS CONNECTED WITH THE TREATMENT OF VARICOSE VEINS OF THE LOWER LIMBS.

Delivered at St. George's Hospital, December 7th, 1897,

BY

WILLIAM H. BENNETT, F.R.C.S., etc.,

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Surgeons of England.

GENTLEMEN,—One of the most interesting ques-
tions arising in connection with varix is this:—
What are the factors which determine the onset of
trouble in some cases, for, as you know, varicose
veins often give rise to no trouble of any kind?
It is certain that troublesome symptoms arise in
many cases, and it is equally certain that more
trouble, as a rule, occurs in women than in men.
Frequently the trouble seems to arise without any
manifest cause. Some people may suffer from
varicose veins as large, perhaps, as an index

finger, in the lower limbs, for the whole of their
lives without experiencing any inconvenience at
all ; on the other hand, some, having apparently
precisely the same condition at first, will in the
course of a few years, sometimes in the course
of a few months, begin to suffer inconvenience ;
œdema, eczema, or other complications subse-
quently arising. The reason of the occurrence of
trouble is, in some cases, extremely difficult to
understand, whilst in others it is readily ex-
plained. You will recollect that in speaking of
the anatomy of these veins in a previous
lecture, I stated that it may be considered that
a large number of the veins are defective in some
way in their valves. But this is not by any
means the case in all varicosities, especially those
which are obviously congenital (and they really
form the majority of the cases met with), the
veins being then only large and tortuous and not
defective in their valvular arrangements ; there is,
therefore, no reason under ordinary circumstances
why trouble should be caused by them. Sup-
posing, however, that in consequence of some
pathological change, or because some special strain
has been thrown upon them, any of the valves
give way or become defective, the veins are then
reduced to the condition of an imperfect piece of
mechanism, inadequate for the performance of its
normal function. Under such circumstances, the
first symptom which shows itself is slight increased
fulness of the veins, followed possibly by œdema,
the consequence of the tendency to blood stasis.
Complete stasis, of course, does not generally
occur early in the affection, but the blood current
may become so slow and the circulation so feeble
that exudation takes place into the perivenous
tissue, producing what is commonly called œdema.
It is worthy of remark that this particular trouble
(œdema), which arises spontaneously in connection
with varix in its early stage, is met with almost
entirely in women. It is a comparatively rare
thing to see varicose veins in a man give trouble
in the first instance merely by causing œdema ; in
men the first symptoms generally result from trau-
matism, and rarely occur spontaneously. It will

be found also that this œdema in women com-
mences very frequently between puberty and
twenty years of age—just at the time, in fact,
when the catamenial affairs are prone to be in
some way irregular. In the ordinary way, women
with varicose veins are apt to suffer from œdema
if the catamenia do not assume, almost imme-
diately after their onset, a normal condition. The
cause of the œdema in these circumstances is not
altogether easy to explain—still its frequent exist-
ence is a fact. Later on, when the catamenia
become normal, the œdema usually disappears ;
but women who suffer from varicose œdema in
this early period of life almost always suffer greatly
from varicose complications during child-bearing
—a useful clinical fact.

In both sexes when approaching middle age
there are often found associated with varicose veins
frequent attacks of cramp, and you may be quite
sure (this is another good point to remember
for clinical purposes) that when a patient com-
plains of these cramps, the varicose state is
about to increase. As far as I understand
them, the cramps appear to be due to the
repeated occurrence of small thrombi in the intra-
muscular veins. The cramps occur without any
apparent cause ; they are very acute, but transient.
The distinguishing points about them are the
pain and tenderness which persist for a short
time subsequently, and are quite unlike any-
thing occurring in ordinary cramp, in which no
tenderness or pain follows the attack. When these
cramps occur, some change in the veins themselves
invariably follows soon or late ; generally the ves-
sels begin to increase in size and number ; œdema
may then commence, in consequence of the
obstruction to the circulation produced by large
numbers of the small thrombi. It is generally
after the occurrence of these changes that patients
present themselves for advice, i. e. when they have
noticed either some change in the size of the veins
or when they begin to suffer pain and discomfort.
The important question in any given case then
arises—Is active treatment desirable ; and if so,
what shall the treatment be ?

It is of great moment to understand that in cases
where no inconvenience or other symptom arises,
the mere existence of varicose veins as such is no
justification for any treatment at all. In a large
number of cases, active treatment, when there are

no symptoms, and no changes are taking place in the
veins, does distinct harm. Here let me warn
you, in passing, against the damage that may be
done by that apparently innocent appliance which
goes by the name of an elastic stocking. Under
ordinary circumstances the natural sequence of a
visit to a practitioner on account of varicose
veins, whether associated with discomfort or not,
is the wearing of an elastic support of some kind.
Such a support is easy to prescribe, and readily
obtained ; it is not, however, always easy to know
exactly when an appliance of that kind is necessary,
and it is often very difficult to get the appliance
properly fitting and properly made.

An elastic stocking if it does not fit perfectly is
harmful ; indeed, I can say with the assurance of
experience that in a very large proportion of cases
of varicose veins, troubles arise solely because
badly fitting appliances have been used. Unless
it is absolutely necessary, a patient should never
be advised to use a support of any sort. There
are three very good reasons for this assertion :
first of all, the use of any treatment which is
unnecessary is essentially bad practice ; secondly,
if the apparatus itself is improperly made or im-
properly applied, it will certainly prove harmful ;
and thirdly, it must be borne in mind that if a
patient begins to wear a mechanical support of any
sort in these cases, it can rarely be afterwards dis-
pensed with. What, then, are the conditions which
render the use of a support necessary or desirable ?
This to some of you may appear a very trivial
matter, but I can assure you that it is, as a practical
question, often very important. After the onset
of the cramps to which I have referred, some
elastic support is distinctly indicated, with a view
to the prevention wholly or in part of the œdema
which is apt to arise, and in order to afford sup-
port to the muscles which is very helpful under
certain circumstances. If the veins in the leg are in-
creasing in size, and if an operation for sufficient
reason has been negatived, or if the patient is not in-
clined to submit to the radical treatment if it be
advised, of course a support may be provided, but
elastic bandages or stockings should not be pre-
scribed in all cases of varix as a routine practice. One
of the most prolific causes of increase in varicose
veins, and of the various troubles which arise in
connection with them, as you well know, is a con-
striction in any part of the limb. An unskilfully

made or badly fitting elastic stocking always acts more or less as a garter in some part, generally at its upper end, and it will be found that a majority of the stockings obtained through the usual channels are much too tight just below the knee, so that they act as a constriction in that position; thus they provide the very best means to promote increase in the size, &c., of the veins in the first instance, and to bring about subsequent complications, especially thrombosis. Harm may therefore be done even by such a simple appliance as an elastic stocking, in an ordinary case of varicose veins of the leg, unless the appliance is of the most perfect kind.

Let me also impress upon you especially the danger of using a badly fitting or badly applied elastic stocking or bandage around and above the knee; there is no more prolific source of trouble in varicose veins than this. Personally I rarely allow a patient to wear a support about or above the knee; it is hardly ever useful, and is frequently dangerous. A few years ago I had under observation a case in which a thrombus, directly traceable to the wearing of a tight elastic support in a moderate varix at the inner side of the thigh, was followed by fatal embolism, and it is in my experience quite an ordinary occurrence to be told by patients that varicose veins, which had existed for years, had shown no sign of increasing or of giving trouble until, after advice, the use of elastic stockings or bandages had been commenced.

In ordinary cases of varix, when stationary, no treatment then of any kind is necessary excepting when well-marked cysts exist; the patient should be advised to disregard the condition, to take ordinary exercise, but to carefully avoid as much as possible *standing still for any long time in the same position*. Moderate exercise diminishes the tendency to increase, but standing for any considerable period in the same position directly tends to progressive increase in the varicosity. In the early stages of varix, particularly if a general feeling of weakness in the limb be present, a valuable treatment is massage, but if cysts exist, massage is entirely contra-indicated. The occurrence of crampy pains also, of course, negatives massage, because, as I have said, the cramps are due to multiple small thrombi, and massage in thrombosis may be a very disastrous proceeding.

Operative treatment may be rendered necessary or desirable by—(a) increase in the varicosity; (b) the existence of large cysts or dilatations, especially on the inner side of the knee; (c) the occurrence of discomfort or other complication; (d) the requirements of the public services.

As to the methods of operating, they are for practical purposes confined to the following: (1) simple ligature; (2) excision, hæmorrhage from the divided veins being prevented when necessary by ligature or torsion; (3) torsion and avulsion.

Excision comprises three methods: (a) the removal of a large number of small portions of the veins throughout a considerable extent of the limb; (b) the excision of considerable lengths of individual veins; (c) the removal of isolated varicose masses.

After what may be justly described as a very large experience, during which I believe I have tried the various methods of operation which have been from time to time suggested, I am fully convinced that the excision of considerable portions of individual veins is in the great majority of cases the best treatment. The point of the greatest importance in operating in varix of the lower limbs is this: *It is absolutely essential, excepting in small local congenital masses, that a portion of the saphena vein at the knee or in the thigh should be removed.* If this essential detail is omitted a permanently good result rarely follows, and what is called a recurrence of the varicose veins is more than probable, no matter how freely they may have been dealt with below, unless, indeed, the whole of the saphena in the leg has been removed.

It is probably best in these operations, when ligatures are necessary, to use some absorbable material, as necrosis of the end of the tied vein, which is often of poor vitality, is less likely to occur than when silk is used. Speaking generally, the fewer ligatures used of any kind the better; and as it is usually easy to arrest any bleeding, which does not cease spontaneously, by gentle torsion or merely pressure, the number of ligatures required are in the most extensive operations very few; indeed, in very many cases they are altogether unnecessary.

The operation by torsion and avulsion which is in favour with a few surgeons at the present time I cannot recommend to you; it is true that large portions of the affected veins can by this method

be removed through a very small wound, but the hæmorrhage under the skin which is prone to follow is at times very extensive, and affords a complication which in itself may prove much more difficult to manage than any wound however long, could possibly do; very acute pain also sometimes follows this method. So far as I am concerned, the only cases of operation upon varix which have given a moment's anxiety are those in which the veins have been removed by avulsion. Isolated cysts connected with varicose veins should be removed, although they may have given rise to no trouble.

The effect of operative treatment upon the lines just indicated is in suitable cases often remarkable, and invariably beneficial. When disappointment in the result follows, it is almost certain to be due to an inadequate operation or to an error of judgment in the selection of the case.

It is, I suppose, hardly needful to say that a cure in the true sense of the word is impracticable, excepting in localised masses of congenital varix which can be completely eradicated, because the complete removal of the whole of the varicose veins in an ordinary case is out of the question. It is, however, certain that in properly selected cases the increase of the varicosity can be arrested, the tendency to complications diminished, pain, discomfort, and feelings of weakness removed, and that the further necessity for the use of artificial supports, elastic or otherwise, may in a considerable number of cases be obviated—an inestimable boon to many persons. Objection is at times taken to the operative treatment on the grounds that if a portion of the affected veins is removed, other vessels appear to supply their places, and thus a recurrence of the varicosity is common. Recurrence in the true sense is usually due to inadequate operation (e. g. the removal of small portions of varix in the leg whilst the saphena is left intact). After the complete operation a few new developments of varix may appear in advanced cases, but they afford no real objection to the operation, as they rarely give rise to trouble or inconvenience, and in no way diminish the benefit derived from the operation, excepting, perhaps, from the æsthetic point of view. The following is a case in illustration :—A man of thirty years of age was the subject of extensive varix, on the inner side of the left knee, which by its increase and sensitiveness

rendered riding impossible. The varix was removed in the ordinary way, after which riding and rough exercise, previously impossible, were resumed. Three years afterwards a tortuous vein along the outer side of the knee was noticed, passing across to communicate with some dilated veins on the inner side of the leg. After growing to a certain extent this vein became stationary, and has never given rise to the least trouble. Here, undoubtedly, a new development of varix occurred after the radical treatment, either as a coincidence or in consequence of the operation. It would, however, surely be unreasonable to raise an objection on that account to an operation which had effected completely what was aimed at by its performance.

It is impossible to be too careful, before subjecting a patient to operation, in ascertaining with certainty that the trouble complained of is connected with the veins, and not with some other condition. It is sometimes by no means easy to be sure in this matter. I had a remarkable instance of this myself about two years ago, in a man who was engaged in some active occupation, and who was, therefore, very anxious to be able to get about as much as possible. He came to me on account of extensive saphenous varicosity in both lower limbs, and he described symptoms which might have been due to the condition of the veins. Not very long before, I had operated upon a friend of his who had suffered much from varix, with the result that all his symptoms were removed, a fact which impressed the patient of whom I am now speaking a good deal, and led to his seeking advice. His principal complaint was weakness in the lower limbs, with sensations of great fulness ; sometimes he suffered from cramp —symptoms which are met with in varicose veins. At the same time I could not assure myself that the symptoms were connected with the veins ; my impression was that there must be something more serious in the background. I told him, therefore, that although many of his symptoms were nearly identical with those sometimes caused by varicose veins, I did not think he would be wise in having an operation performed, because I was not sure that the symptoms would be cured by that treatment. He went away apparently content, but a fortnight afterwards he came back, and said, " In spite of what you told me the other day, I am

absolutely certain that all my trouble is connected with these veins, and I really wish you would operate upon them." I told him I was averse to the operation, but that as he greatly desired it I would operate, although he must not blame me if no material good resulted. I subsequently operated on both limbs. For the time being he was very much satisfied, went about his work again, doing rather more than usual. I saw that man again a year later, and although his veins were greatly benefited by the operation, the symptoms of which he complained were worse; in fact, he had developed symptoms of an obscure nervous degeneration, which was obviously incurable. In that particular instance, although it is true the treatment did no harm, it certainly did no good, it was merely futile. Such a case might under some circumstances be a very serious matter for a practitioner; supposing, for example, that such a patient presented himself to one of you at the commencement of your career, and, your experience not being great, he were advised to have an operation performed on his varicose veins, with the assurance that it would afford great relief if not absolute cure. The position of a practitioner under those circumstances would not be enviable.

The "bursting" of a varicose vein is a complication to which an exaggerated importance is attributed by non-professional people; it is, in reality, not a common occurrence under ordinary circumstances, in the absence of eczema, ulcer, or inflammation. The "bursting" of a varicose vein in the ordinary sense does not occur, as a rule, before middle life—a point worth noting, because you would naturally expect that such an accident would be more likely to happen in younger subjects by reason of their activity, &c., which constantly throws great strain upon the thinned veins. It is, however, the exception, as I have stated, for a varicose vein to burst before middle life. The explanation is very simple in the light of what I mentioned in a previous lecture, viz. that although veins do not, generally speaking, tend to become atheromatous in the same way as arteries, atheroma in certain forms of varicose veins is common enough, affecting more particularly the portions of veins which are very much dilated, especially in the case of cysts. The thinned walls, when atheromatous, bear strain very badly, and readily give way. If varix gives rise to no trouble before

advancing age, i.e. about sixty, trouble rarely occurs at all, unless as the result of traumatism. It is somewhat difficult to give a rational explanation of this, especially when one bears in mind the tendency of the generality of vein valves to become inadequate in the later periods of life; for in younger subjects affected with slight varix, if the valves give way, trouble of some kind is practically certain to follow.

By far the most important complication of varix is thrombosis, a subject which I propose to deal with in a later lecture.

A Stage in the Development of the Placenta.

—Hahn ('Zeitschrift für Geburtshülfe und Gynäkologie,' Band xxxiv, s. 519, 1896) reports a case of abortion at the fourth month, in which, on admission of the patient into Küstner's clinic, a fœtus twelve centimetres long had already been expelled. The thin cord was in the woman's vagina, and through the os, which was wide enough to admit a finger easily, a soft body as large as a walnut projected, and turned out to be a projecting flap of the placenta, bearing the nearly marginal insertion of the cord. It was remarked that the maternal side of the placenta was nearly as smooth as that to which the cord was attached, and this smoothness extended some distance higher up. Hahn points out that in this case there was a reflex placenta of considerable size, for the smooth, thick, decidual investment which completely clothed the lower portion could, from its macroscopic appearance, its relation to the limiting ovisac, and the feeling to the touch above mentioned, only be regarded as decidua reflexa. The fact that the cord was inserted on the projecting reflex portion, and that the villous tissue exhibited most development about the insertion of the cord, Hahn considers a new proof of Kellman's theory, according to which the position of the placenta merely depends on the primitive insertion of the allantois on the chorion, —that is to say, what becomes later the insertion of the umbilical cord.

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ABNORMAL BREATHING.

Clinical Lecture at the Brompton Hospital.

Delivered December 15th, 1897,

By Dr. MAGUIRE.

IN the short time at my disposal I can deal only with a few examples of abnormal breathing and their indications, as you will understand when I remind you that coughing is a form of abnormal breathing, and would alone require a lecture for itself. I propose, therefore, to discuss with you to-day the breathing of emphysema, asthma, and the Cheyne-Stokes phenomenon, with some other forms which I think are related to these.

First let us consider the breathing which occurs in connection with emphysema. Emphysema is, as you know, a condition in which the air vesicles of the lung are actually or relatively enlarged ; or better, as Sir William Jenner taught, a condition in which the air contained in the lung bears to the solid tissue of the lung a greater than normal proportion. Thus the amount of air in the lung may be greater than normal, and the solid matter normal in amount, or the contained air normal while the solid tissue is atrophied and less in amount, either condition agreeing with the definition. The latter is called the atrophous form of emphysema, and is the rarer; while usually, in speaking of emphysema we refer to the hypertrophous variety. In both forms there is pathologically a lack of elasticity of the lung, and clinically a difficulty in breathing. There is a difficulty of expiration because the lung is over-expanded and inelastic, and the patient is compelled to make effort to expel the air; but the greater dyspnœa is inspiratory, and the earliest physical sign of this is a raising of the chest, which has given rise to the classic description of the emphysematous chest as "barrel-shaped." The essential change of form, however, is a deepening of the antero-posterior diameter of the thorax. It is true that sometimes this is obtained by raising and forward expansion, forming the true "barrel-shaped" chest, but more frequently that extra length of diameter from before backwards is got by a rounding of the shoulders ;

this is shown by nearly all emphysematous patients. In the patient's effort for inspiration all the unusual muscles are brought into play ; as in the man before you, the sterno-mastoid stands out, the two heads of its thoracic insertion being clearly seen, the splenius and scalene muscles are in firm contraction ; sometimes the trapezius and even the little omohyoid muscle can be observed in use. You will notice, too, a characteristic abnormality in the movement of the lower ribs. As you see, they sink inwards instead of moving outwards as in a healthy person, and still more is this apparent if I ask the patient to make a stronger inspiratory effort. In extreme cases of emphysema, even the lower end of the sternum is depressed in inspiration, but this is rare. All these conditions are found whenever there is obstruction to the entrance of air into the lung, and most markedly when the larynx of a young child is narrowed by diphtheritic membrane. In such an instance the depression of the ribs and of the sternum is often more pronounced than in emphysema, because the bones are more yielding. In emphysema, however, the hindrance to the entrance of air is caused not by a narrowing of the air passages, but by an inability of the lung to expand further, and so receive the inspired air. But the result is the same,—sufficient air does not enter the lung, and partly for this reason we have the exaggerated efforts which you see. Let us inquire into the origin of this abnormal rib action. Is its cause active or passive ? Are the ribs drawn in by muscular action or forced in by atmospheric pressure ? You will remember that the diaphragm is attached to the lower six ribs and to the vertebral column. It has a very peculiar action, for while most other muscles during contraction approximate their bony insertions the diaphragm does not, but uses them as *points d'appui*, whereby to lower its own vault and act as an inspiratory muscle. But when we see all the other inspiratory muscles acting so strongly, and that it is only those ribs to which the diaphragm is attached which are depressed in inspiration, the thought occurs that the diaphragm also must be acting strongly, and in doing so may pull inwards its costal attachments. The depression of the ribs would then have an active cause. But further observation will show you that this is not true. Look closely and you

will see that the intercostal spaces and also the parts above the clavicles are depressed at the very beginning of inspiration. This is abnormal. In health, at the moment when inspiratory effort tends to produce negative pressure within the lungs, air rushes in at once, the lungs expand, and these spaces under observation have no chance of depression. In emphysema, on the other hand, the inelastic lung refuses to expand, and so the outside atmospheric pressure forces inwards the soft spaces. Again, I have mentioned that the lower end of the sternum may be depressed like the ribs, and we know that the diaphragm has only a slight attachment to the ensiform cartilage, and none whatever to the sternum. The lower six ribs are not so strongly supported by outside muscles as are the upper ribs, nor are they so firmly attached to the sternum, and thus would be the more easily depressed by atmospheric pressure, entirely apart from their connection with the diaphragm. We must thus come to the conclusion that the movement of the ribs is passive, and due entirely to the lack of expansibility of the lungs.

The power which thus crushes in the lower ribs must be great, for the subjects of emphysema in which the sign is most obvious are commonly advanced in life, and their costal cartilages are ossified, thus resisting depression. Moreover, the patient before you shows how nature is doing its best to overcome the movement, for observe how, in what is for him quiet breathing, the processes of his serratus magnus muscle project from the surface of the chest in firm contraction, trying to pull outwards the lower six ribs and their cartilages. Yet still the depression takes place.

This mobility of the lower ribs leads to a further inspiratory difficulty for the emphysematous, to explain which I will refer to a form of abnormal breathing which is made use of for art. The teachers of voice production, whether for purposes of singing or of elocution, lay great stress upon abdominal breathing, that is, inspiration by the diaphragm alone. The shoulders are to be thrown backwards, the chest raised and kept rigidly so, while all apparent respiratory movement is made by contraction or relaxation of the diaphragm. In this way the greater part of the thorax is held as a reservoir and possibly as a resonating chamber, while with practice the action of the diaphragm is so much strengthened, that

the performer having his back to a wall, can move forwards a heavy chair or table placed against the abdomen. This is taught by rule of thumb. I have never seen any rational explanation of its mechanism, and doubtless the lack of this is the reason why the pupils have so much difficulty in understanding their teacher. After much practice the method of breathing suddenly dawns upon them in some unknown way. But here is the explanation. The upper six ribs are raised and held firm by the pectorales and shoulder muscles, the lower six ribs are raised and steadied by the serrati magni, and then, with its costal and vertebral attachments firm and immovable, the diaphragm is in the best possible condition for exerting itself as a powerful inspiratory muscle.

Consider, then, in what difficulty an emphysematous patient is placed, at the time when he most needs his strongest agent of inspiration. The diaphragm has lost one of its fixed *points d'appui*, and, when the ribs move, can only feebly depress its vault. The more advanced the emphysema, and the greater the movement of the ribs, the less do we see of the abdominal evidences of diaphragmatic movement, though the failure is partly overcome by increased voluntary effort. In the patient before you, observe particularly the part of the abdominal wall immediately below the ensiform cartilage. In a normal person the earliest sign of diaphragmatic contraction is seen here as a protrusion of the abdominal wall, but in emphysema there is instead of this a distinct depression at the beginning of inspiration, showing that the negative pressure in the chest is too much to be overcome by a slight diaphragmatic contraction under these unfavorable conditions.

What is the reason for the great dyspnoea of emphysema? It is true that the lung has lost the greater part of its expansibility, but emphysema does not attack the whole of the lung at once, and dyspnoea of some degree is an early symptom. Emphysema is first found in the parts of the lung which are least supported, such as the borders, the parts above the clavicles, and especially "Traube's lobule"—the little tongue of left lung which projects forwards and inwards below the heart. The remainder of the lungs as yet is free. Now, in health, none of us when at rest use the whole of the lungs, and we have no dyspnoea. Why, then, should the emphysematous person pant when he is at rest,

while he still has for use quite as much lung as ordinary persons need in such a condition? Lack of expansibility of lung will not completely explain this, but pathological anatomy does. The same argument holds good in both the atrophous and hypertrophous forms, but for convenience we will take Hypertrophous Emphysema first.

The air vesicles are stretched and their walls thinned, but what happens to their blood-vessels? These as they follow the vesicular wall, are stretched and their calibre is lessened. You can see, post mortem, not only this but its effects, for the narrowing of the vessel causes difficulty in the passage of blood along it, and after a time thrombus forms in its interior, and finally there ensues complete atrophy of the vessel, a narrow black streak along the wall of the alveolus indicating its former presence. For perfect respiration we require not only inhalation of air, but contact of fresh layers of blood with the air, and the change in the blood-vessels described hinders this. In atrophous emphysema the tissue change takes place without the stretching of the alveolus, but the result is the same. Here, then, we have the explanation of the greater part of the dyspnœa; it is circulatory in origin, and a knowledge of this gives us an indication for treatment. We must stimulate the right ventricle by strychnine, and sometimes digitalis, to make it do more work. There is not in this condition the objection to the use of these drugs which obtains in the heart failure of Bright's disease, of which I have spoken in a former lecture. There they have a tendency to contract the peripheric arterioles by means of the vaso-motor system, and so increase the blood tension, against which the heart is straining. But the pulmonary artery has no vaso-motor nerves, as was shown by the elder Waller, and therefore we can get the stimulating action of the drugs on the ventricular wall without increasing the peripheric obstruction. The nutrition of the heart wall must also be kept up by the hygienic measures made use of in cardiac disease. In this way a hypertrophy of the right ventricle may be induced, which for a time at least compensates for the pulmonary obstruction and relieves the dyspnœa of the patient.

The next form of abnormal breathing I direct your attention to is that of so-called *asthma*, under which head many conditions are confusedly enrolled. Thus the laity, in speaking of an "asthmatic person," generally allude to one who is subject to chronic bronchitis and emphysema. This is not really asthma, though it has, as will be seen, clinical and pathological relations to it.

That which has most right to be called asthma is the so-called bronchial spasmodic asthma. It is a condition of things which comes on usually after a patient's first sleep. It generally wakes him between two and four in the morning, because of a difficulty of breathing, which is followed, not preceded, by cough. After some time, say two hours or so, the attack passes off, usually with the expectoration of sputum, often in small viscid lumps, but sometimes copious and frothy, and then the patient may become comparatively well. The essential symptom is difficulty of breathing, both inspiratory and expiratory. During the attack the chest is abnormally expanded, but I think the real difficulty is in the entrance of air into the air vesicles. The expansion of the chest of which I have spoken, and the consequent straining in expiration, are due to the fact that air which has entered with difficulty is also not easily expelled, especially, too, as expiratory is less than inspiratory power; but the initial trouble is the incomplete entrance of air into the air vesicles.

What is the explanation of this? That which has been very generally accepted is that the muscles of the smaller bronchi are spasmodically contracted, and thus the lumen of the tubes narrowed. But I think this view has been too readily accepted, though I am not prepared to say it is untrue. Although usually short in duration, the attack may last for hours or days, and it is not easy to believe that the small muscles of the bronchial tubes can keep these tubes so contracted for such a long period as to seriously obstruct the entrance of air; nor, again, in spite of the experiments sometimes quoted, can one readily admit that their contraction even for a short period can cause the extreme symptoms sometimes seen in bronchial asthma. Moreover, this view does not explain the ending by cough, and the expulsion of viscid sputum, containing the so-called asthma spirals of Curschmann.

Everything, however, occurring in the attack would agree with the view that there is really an inflammation, or at any rate a congestion, of the mucous membrane of the smaller bronchial tubes. The tubes are lined by an extremely sensitive

mucous membrane, which becomes very easily congested. The mucous membrane by its congestion and consequent swelling can very rapidly interfere with the lumen of the tubes, and so with the entrance of air during inspiration, and its expulsion in expiration. The suddenness of the attack is by no means against this theory. Let me remind you of the condition known as non-membranous croup of children. Here a child has been out at play during the day, possibly in fine weather; at bedtime it may be feverish or in the best of health, yet in the early hours of the morning it wakes, making a crowing sound, and has great difficulty of breathing for some hours. Remedies having been applied, the symptoms subside, and after some troublous sleep the child wakes, a little hoarse, but with little or no difficulty of breathing. The attack may be repeated, and we know from laryngoscopic examinations that the pathological condition is a congestion of the mucous membrane of the larynx, where there is very little room for mucous swelling. The swelling of the membrane is soon excited, and almost suddenly allayed. Can this not also occur in the smaller bronchi? The symptoms and signs during the attack are those of bronchial stenosis, and would be produced equally well by spasm of the tubes or swelling of the mucous membrane. But the ending is much more in favour of the pressure of an inflammatory or congestive state, for then comes this coughing up of sputum that must be ejected before relief is obtained, and we know that secretion is the natural cure of a congested mucous membrane. I have mentioned the fact that the fibrinous bodies known as Curschmann's spirals occur in asthmatic sputum, and I have known one instance in which plastic bronchitis gave way to attacks of spasmodic asthma. This would indicate that there really was an inflammatory condition of the mucous membrane during the asthmatic attack. Cold would produce this, and nervous disturbances, direct or reflex, might influence the mucous membrane through the vaso-motor system. Although, then, one cannot disprove the existence of spasm absolutely, it must be admitted that it is a pure assumption, and I much prefer to adopt the view which really rests upon facts. According to this there would be no essential pathological difference between the dyspnœa of spasmodic asthma and that of simple bronchitis, the clinical differences

being due to the narrower lumen possessed by the different tubes affected. It will be remembered, too, that simple chronic bronchitis in its severe forms shows a dyspnœa differing but little from that of spasmodic asthma.

There is a nervous form of asthma which should be separated from the bronchial forms and should be called *nervous dyspnœa*, and is usually reflex in its origin. As you will understand from the diagram before you, copied from Waller's 'Physiology,' the respiratory centre can be influenced reflexly from the nostrils, the skin, the larynx, and from the lungs themselves, and from the cortex cerebri by emotions. Congestion of the smaller bronchial tubes, as in the spasmodic asthma just described, may be set up by reflex influences through the vaso-motor centre, for you must remember that although, as mentioned above, the pulmonary artery is devoid of vaso-motor apparatus, the bronchial arteries, which are the nutritive arteries of the lungs and bronchi, are governed like other arteries of the body.

But reflex influences more often cause nervous dyspnœa without bronchial congestion. Then we have what is really a hurried panting, both inspiration and expiration being affected, and there is no cyanosis. Such is the breathing which so frequently accompanies hysteria, but it is also seen in persons who are in no way hysterical, but who are pulled down by illness, and I have seen it frequently after influenza.

It is of purely nervous nature, probably caused by a disturbance in the path between the brain cortex and the respiratory centre, for it is always accompanied by great nervous prostration.

A hysterical subject will not, or cannot, carry out instructions, but I have observed that other patients suffering from this dyspnœa are greatly relieved by following the directions given by singing-masters as to the manner of breathing—that is, by using the chest as a reservoir for air, and employing the diaphragm alone for respiration. I have found the same method give relief in the dyspnœa of long-standing bronchitis and heart affections. Why this should be is at present a matter of pure speculation, and such idea as I have in my mind as to the explanation is too wild and unprovable a hypothesis to as yet warrant public mention. But I may offer for your consideration a little experiment which each can at once carry out on

himself. Sighing is an abnormal breathing, which if involuntary is generally due to lack of nervous energy. It is not always emotional, for it may be seen in an infant incapable of true thought, and must then be due to spontaneous action of the respiratory centre. Now, make a sigh as far as possible without moving the diaphragm, that is, what is ordinarily a slight sigh, and you are conscious of no change in your well-being. But make a very deep sigh, and as far as possible with your diaphragm alone, and you at the end of the expiration feel, for the moment at least, a pleasurable sensation. This is as far as I think it desirable to go for the present, but it is obvious that something more than mere oxygenation of blood is caused by the movement of the diaphragm.

Cheyne-Stokes respiration is so named after the two Dublin physicians who, in 1816 and 1854 respectively, first described and studied it. It is a form of periodic respiration characterised by a pause in the breathing, followed by increasingly deep respiratory movements reaching an acme of tumultuous dyspnœa, after which the respirations gradually decline in force until at last a complete pause is again reached. It is found in uræmia, in various heart affections, in brain affections such as tumours, hæmorrhages, and meningitis, and can be produced experimentally in animals by morphia poisoning, bleeding, and operations on the brain which will be described later. Nearly all the states in which it occurs are very perilous to life and accompanied by extreme feebleness, and, I think, always by great depression of the higher cerebral faculties; indeed, the patient is nearly always unconscious. I have had Cheyne-Stokes breathing myself when seriously ill from seasickness, and I have seen simple nervous dyspnœa sometimes assume this rhythm. But in most cases it is soon followed by death, and is therefore of the gravest significance.

Many theories have been put forth to explain it, amongst others a most complicated one by Filehne, which has been received with more favour than any other, though it is admitted that all are unsatisfactory. This theory, in short, is as follows: —Filehne starts with the view that the respiratory centre, because of long-standing interference with the arterial supply of the medulla oblongata, becomes deficient in irritability, as was previously ʳted out by Traube. Consequently it allows

so much impurity to accumulate in the blood that the vaso-motor centre for the arteries of the brain becomes stimulated before the respiratory centre begins to act; and thereby is produced an anæmia of the medulla which, together with the venosity of the blood, at last gradually stimulates the tired respiratory centre to action and to greater action than the normal amount of stimulus would call forth. The blood then being more oxygenated, the vaso-motor centre gives way, and so large a quantity of more or less oxygenated blood rushes to the respiratory centre that its action is gradually stopped and apnœa results, the cycle being repeated.

In favour of this view is the known fact that when the blood is deficient in oxygen, the vaso-motor centre is excited, as shown by the tracings of blood-pressure taken by Filehne himself. But there are many objections to this theory, into which it would be out of place to enter in a clinical lecture. Suffice it to say that the theory obviously involves many assumptions, and most of its conclusions can be explained in other ways.

But let us review the circumstances of the Cheyne-Stokes breathing in so far as concern facts, clinical and experimental, which are certainly known to us. The respiratory centre is undefined, but is situated in the medulla oblongata. It is stimulated by blood, impure from carbonic acid, to produce respiratory movement, while unduly oxygenated blood so calms it as to cause apnœa. Afferent impulses from the lungs, carried mostly by the left vagus, also excite it. A very small amount of carbonic acid gas in the blood is enough to stimulate the centre, and in healthy life its action is rhythmic and easy. But, as you will see represented in Waller's diagram, the centre is not left entirely to mere automatic ungoverned action. Like all the nerve-centres in the medulla, it is controlled by impulses from the brain cortex, and there is reason to suppose, from experiments I will mention, that these cerebral impulses are employed in maintaining a rhythmic movement, when otherwise the ungoverned nerve-cells would be tumultuous and, as it were, epileptic and irregular in action, reacting to stimuli too easily and too forcibly for the needs of the body. Now, experiments are performed by nature which show what happens when the higher control is inactive. Yawning is an abnormal breathing which occurs when the

cerebral functions are tired ; it is unnecessary for respiratory purposes, and is an irregular action of the medullary respiratory centre. Involuntary sighing, as I have already mentioned, comes into the same category. All the cerebral functions are weakened during sleep, and in very deep sleep a periodic respiration resembling that of Cheyne-Stokes can be sometimes observed in adults. This is rare, for in adult life the cerebral controlling functions are so highly developed that they will act even during sleep. But in the infant the control has not yet attained perfect strength. It is usually sufficient while the child is awake, though not infrequently a very young child shows a periodic breathing even when awake, but during sleep the breathing of an infant simulates closely the Cheyne-Stokes type. Again, recently I watched the breathing of an idiot young man whose life was almost mechanical, and he during sleep, more frequently than not, showed this Cheyne-Stokes phenomenon. His higher cerebral control would not stand the strain of sleep relaxation, and so his respirations were then grouped. Dr. Goodhart ('Clinical Journal,' vol. i) has said that Cheyne-Stokes respiration is a reversion of the respiratory centre to its less educated form ; but this, I think, is not quite accurate, for the breathing of children here described is a simulation and not a reproduction of the Cheyne-Stokes phenomenon.

In the 'Journal of Physiology,' vol. xii, No. 3, 1891, Professor Sherrington has described experiments upon the frog which have an important bearing upon this point. The breathing of the frog in the normal state is not equal and regular like that of higher animals. It consists of slight rapid movements of the floor of the mouth and throat, which of themselves are insufficient for complete respiration. But less frequently there occur larger movements of the pharynx and larynx, preceded by a passive in-sinking of the flanks, which complete the respiratory mechanism, and according to Langendorff are the true respiratory movements. Here, in an animal of low cerebral development, there is normally a periodic grouping of the respiratory movements. Wedenskii, indeed, has shown that the larger of these movements often exhibit accumulative series of respiratory actions, but this in the normal state has not been seen by Knoll or by Sherrington. According to Heinemann, the two kinds of move-

ment are due to action of the same respiratory centre in different degree. But, normally, this change from one movement to the other is abrupt. Newell Martin found that after removal of the cerebral hemispheres and optic thalami from a frog, the breathing is more regular and less liable to sudden change. Sherrington, however, has shown that this is only a temporary state, for if the frog be left quiet for thirty or more hours after removal of the hemispheres and thalami, the respiration is distinctly of the Cheyne-Stokes character, the smaller respiratory movements increasing gradually in scope till a larger "true" respiratory movement takes place, when the movements begin to decrease until there is almost total extinction. Knoll, too, previously had remarked that the breathing of the frog was often periodic when the brain was removed, but without giving further particulars. Luchsinger and Sokolow, by drowning and by ligation of the aorta, and also Langendorff and Siebert, by interfering with the circulation through the medulla oblongata, have similarly produced Cheyne-Stokes respiration in the frog, while bleeding has induced it in the rabbit. It will be observed that in Sherrington's experiments the cerebral hemispheres and optic thalami were alone interfered with, while the means employed by the other observers affected the medulla oblongata, with or without the upper parts of the brain.

Here, then, we have evidence that Cheyne-Stokes breathing occurs when, experimentally, the respiratory centre is removed from the control of the higher cerebral centres.

Now, I think that disease sometimes performs for us the same experiment of removing the functions of the higher cerebral centres. By a law of devolution, when vitality fails, its loss is first felt by those functions which are most complex and special, and the last perfected, while those which are simple and general, and the first acquired, will remain untouched. It is not necessary that always the same high functions shall show first the signs of failure, for each man has his own method of dying.* The loss of vitality is often only partial,

* This lecture was delivered before the publication of Dr. Hughlings Jackson's lecture on the " Relations of the Central Nervous System." In that will be found many ideas as to the functions of the highest levels, which support strongly the views here put forth. See 'Brit. Med. Journ.,' January 8th, 1898.

or rather not general, but variably local. In a certain number of cases the control apparatus of the respiratory system will be that picked out for early depression or extinction, and respiration will be carried on by the respiratory centre alone. As mentioned by Dr. Waller, all living matter shows a tendency to pulsatile or rhythmic activity. This is shown most by a low organism, or by a higher organism when a loss of vitality reduces it to a lower level. The respiratory centre is more lowly organised than the higher cerebral centre, and when left to its own devices,—especially, too, when its own vitality is diminished by deficient blood supply, and the centre is therefore liable to show the irritability of exhaustion,—its action will be tumultuous and out of all proportion to the amount of normally exciting influence brought to bear upon it. A rhythmic action of the vaso-motor centre causing the Traube-Hering curves, seen when the blood supply is cut off from the brain, is admitted to be due to exhaustion of the vaso-motor centre, though the experimental conditions by which it is induced, labour under the objection that not the medulla only, but the whole brain, is rendered anæmic. This I must not further discuss ; but the point of the argument required here is that we have an example of a nerve-centre when exhausted showing an irregular form of action, and it is possible that in this instance also we are dealing with a nerve-centre relieved from higher control.

I think, therefore, that the Cheyne-Stokes respiration is caused by a stormy unbalanced action of the respiratory centre, due to a depressed vitality of itself and of its higher cerebral controlling mechanism, and I think that this view is sufficiently supported by the facts I have mentioned to remove it from the level of mere hypothesis.

The breathing of the dying well repays observation. A dying man breathes with a forward and upward throw of his chin, and a corresponding backward movement of the head, during inspiration. This is a further instance of tumultuous action of the respiratory centre, and more frequent than those just described. The patient has used up nearly all his inspiratory powers. He has used up his pectorals, his trapezii, his splenii, and even his omohyoidei, and at last comes to the extreme action of the sterno-mastoid, because his higher centres have given up control and left the respira-

tory centre to free unbalanced action. There is not always cyanosis at this time, therefore the movement cannot be a mere necessary exaggeration of inspiratory effort. You see it occasionally in the later stages of heart failure, some time before death, but only when the patient is sleeping. But if a patient is awake, and this method of breathing is present, you may be certain that death will take place within a very short time. I mention this phenomenon because I have more than once been called for consultation when the patient's friends had not been warned of the gravity of the case, but where this sign showed that no effort to save life could be of any use.

In a further lecture I will discuss with you some of the other forms of abnormal breathing.

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AT a recent meeting of the Berliner medicin-ische Gesellschaft, Dr. Rosin demonstrated a new diagnostic feature of the urine. A man, thirty-six years of age, had at the commencement of his illness much albumen in the urine ; later, however, there was present propeptone (albumose) only to the amount of 6 per cent. The patient died, and the autopsy showed an amyloid kidney and multiple myelogenic sarcoma of the ribs. A review of the literature of the past fifty years disclosed the fact that in the six reported cases in which propeptone existed in the urine the patients had either osteomalacia or sarcoma of the ribs. We may therefore regard a positive relation as existing between albumosuria and this class of sarcomata ; perhaps it is permissible to regard this condition as diagnostic of sarcomata.

Medical Record, January 1st, 1898.

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Angier's Petroleum Emulsion with Hypophosphites.—One of the most valuable properties of this preparation lies in the fact that the oil is merely emulsified, and so minutely divided that its absorption is rendered more efficacious. It is further to be noted that the oil used is exceptionally pure and specially refined. The distinctive gain, therefore, in the administration of this therapeutic agent is that the oil being already prepared for absorption, digestion is not disturbed and assimilation is aided. Clinical experience has shown that in wasting diseases the use of this excellent and almost tasteless emulsion is indicated.

A CLINICAL LECTURE

ON

CASES OF EPILEPSY AND OTHER CONVULSIVE DISORDERS OF THE NERVOUS SYSTEM.

Delivered at the West End Hospital for Diseases of the Nervous System, December 7th, 1897,

By FLETCHER BEACH, M.B., F.R.C.P.,

Physician to the Hospital; Physician to the Chalfont Colony for Epileptics; formerly Medical Superintendent of the Darenth School for Imbecile Children.

PART II.

WE are now in a position to consider the *pathology* of epilepsy. You will remember that I mentioned in a former part of the lecture, that the aura was the result of a discharge or overaction of nerve force, and that by studying the different kinds of aura a clue to the functional region in which the fit commences might be obtained. In the same way by studying Jacksonian epilepsy we are able to fix upon the part of the brain affected by the organic lesion.

For many years it was thought that epilepsy was due to an irritation of the floor of the fourth ventricle, and there is no doubt that convulsions of a special character are so caused, but not idiopathic or Jacksonian epilepsy. Both of these are caused by discharging lesions, or a sudden liberation of nerve force from the cortex of the brain.

Let me call your attention for a few minutes to the parts of the brain which are involved in motor or sensory movements. On looking at this diagram you will notice that there are two convolutions on each side of the fissure of Rolando, the one in front of it being the ascending frontal, the one posterior to it the ascending parietal convolution. These are the two chiefly concerned in motor movements, although parts of the adjoining convolutions are in some movements also involved. Experiments on monkeys were first made, and it was found that by stimulating certain portions of these convolutions certain movements followed. Clinical observation has since shown that many of these movements are due to disease which irritates parts of these convolutions in man. The highest

part of these convolutions is the centre for the *leg*, and the parts involved are the upper parts of the ascending frontal and ascending parietal convolutions, adjacent parts of the superior frontal and superior parietal, and the paracentral lobule, the last of which is situated on the inner surface of the brain.

The centre for the *arm* is found in the middle third of the ascending frontal and ascending parietal convolutions, but more of the ascending frontal is involved than of the ascending parietal.

In the centre for movements of the *face*, the parts involved are the lower third of the ascending frontal and ascending parietal convolutions. The *lips and tongue* are represented together in the lowest part of the ascending frontal and adjacent part of the lower frontal convolution. The orbicularis oris and tongue muscles act together, so the centres for the face and tongue cannot be separated.

All these parts are those supplied by the middle cerebral artery, the largest of the three arteries which supply the brain with blood.

Horsley has within the last few years made experiments on monkeys, and observed that in the centre for the arm the uppermost part was concerned with the muscles for the shoulder, below and posteriorly with those of the elbow, below and anteriorly with the wrist, below and anteriorly with the finger movements, and lowest of all and posteriorly with the thumb movements. In the same way he has subdivided the movements of the leg and face, but it is sufficient for our purpose to keep in mind the broad distinctions first described.

The centre for movements of the *head and neck and conjugate movement of the eyes* he placed in the lower parts of the three frontal convolutions; and the centre for the *trunk muscles* on the inner surface of the hemisphere, corresponding to the region of the marginal convolution.

These motor centres are not sharply defined, but merge imperceptibly into those which lie close to them.

It is thought that the motor centres have sensory as well as motor functions, from the fact that there is often loss of sensation in the hand or foot which has been paralysed by disease in the motor region.

With regard to the special centres, the centre for *smell* is the anterior extremity of the uncinate

convolution on the inner surface of the temporal lobe; that for *sight* is found in the occipital lobes and the angular gyrus; that for *hearing* is the middle of the first temporo-sphenoidal convolution; and that for *speech*, as far as the movements of the lips and tongue are concerned, are in the posterior extremity of the lowest frontal convolution and the adjacent part of the ascending frontal in the left hemisphere.

Applying this knowledge, we are able to explain many of the statements which have been previously made. Thus, when there is a motor aura which begins with twitching or spasm of the thumb or hand, we know that there is a discharge of nerve force from the middle third of the ascending frontal and ascending parietal convolutions. When the motor aura commences in the leg, we recognise that the discharge comes from the upper parts of these convolutions, the part of the convolution situated on each side and the paracentral lobule; and when it commences in the face, and especially in the lips or tongue, we know that the discharge of nerve force is from the lowest part of the ascending frontal and adjacent part of the lower frontal convolution.

Similarly with regard to sensation, which I mentioned before is thought to have its seat in the motor centres. There is some ground for this opinion, for we know that a sensory aura often precedes the motor spasm when epileptic fits are due to irritation caused by lesions in this region. When there is a sensation of numbness or tingling of the thumb, fingers, or palm, we know that there is a discharge of nerve force from the middle third of the motor region, consisting of the ascending frontal and ascending parietal, but chiefly of the ascending frontal.

As regards the special senses, the auditory aura is due to a lesion setting up irritation and causing a discharge from the middle of the first temporal convolution, the olfactory aura to a discharge from the anterior extremity of the uncinate convolution, and of sight to a discharge from the occipital lobes and angular gyrus.

When speaking of aura, I said that a visual is sometimes associated with an auditory aura. This is explained by the proximity of the angular gyrus, one of the centres for sight, to the first temporal convolution, part of which is the centre for hearing.

I also mentioned in a former part of the lecture when speaking of Jacksonian epilepsy that the spasm always takes a definite order; when it begins in the face the muscles of the arm are next affected, and those of the leg last; when it begins in the muscles of the hand, those of the face are next invaded, and those of the leg last; and when it begins in the leg, those of the arm are most affected, and those of the leg last. By looking at the diagram which shows the motor centres you are now enabled to see the reason for this; the centre for the face is below that of the arm, and the centre for the arm is below that of the leg. Hence the discharging lesion spreads from the lowest part of the ascending frontal and parietal convolutions to the highest part of them. In the same way can be explained the order of invasion when the spasm begins in the hand or leg.

Psychical auræ proceed chiefly from the parts of the frontal lobes in front of the motor area, although the centres for motion, sensation, and special sense are also required for the full action of the higher mental faculties.

Visceral auræ depend upon a disturbance of function of the pneumogastric nerve, whose deep origin is in the floor of the fourth ventricle; but as consciousness is lost during the fits, the origin must be in the cortex. As branches are distributed to the stomach, the lungs, and the heart, a disturbance of function of this nerve will account for the epigastric aura, the feeling of choking, and of palpitation and pain in the region of the heart.

Jackson is of opinion that there are three levels of evolution of the central nervous system. Briefly stated, he considers the lowest level, or series of lowest centres, to consist of the spinal cord, medulla oblongata, and pons Varolii. The highest point of these centres are the nuclei for ocular muscles in the floor of the aqueduct of Sylvius, which you no doubt will remember is the opening by which the third communicates with the fourth ventricle of the brain, and which when you studied anatomy was also called *iter a tertio ad quartum ventriculum*. The grey matter of these centres is the nearest to the periphery, and is the first point at which nervous force accumulates. The middle level lies above the lowest centres, and consists of the cortical motor area previously mentioned to you, which was first described by Ferrier and others,

and also of the corpora striata; it also includes the special sense centres, which have also been described. This level contains the centres for motion, sensation, and special senses. The middle centres are the next point at which nervous energy accumulates, and their relation to the periphery is more complex than that of the lowest centres. The highest level consists of parts of the frontal and occipital regions. All are sensori-motor, that is, that in them, according to Jackson, motion and sensation originate; in the highest centres the motor element is more anteriorly, the sensory element more posteriorly. In these centres the movements of the body are most complex, least organised and least automatic, and besides there is another phenomenon, that of consciousness, so that these centres are popularly called the "organ of mind."

According to this theory, the best working theory we have, idiopathic epilepsy depends on discharges of nerve force from parts of the highest level of evolution, while epileptiform seizures such as we get in Jacksonian epilepsy are due to discharges of nerve force from parts of the middle level of evolution. Both are cerebral and both are cortical convulsions. Inward fits, such as we get in laryngismus stridulus, and no doubt other fits, depend upon discharges beginning in the lowest level of evolution. Time does not admit of more being said on the subject.

With regard to *diagnosis*, we have to distinguish the fits which occur in idiopathic epilepsy, from those which take place in other diseases.

Idiopathic epilepsy is distinguished from *Jacksonian epilepsy* by the former being a functional disease, which is attended with loss of consciousness, and in the severe form with general convulsions, while in Jacksonian epilepsy the convulsions are *partial*, beginning with unilateral spasm in the hand, face, or foot, either affecting one limb as in monospasm, or one side of the body as in hemispasm. Consciousness is retained throughout the attack in the slighter forms, and in the severe forms is lost only at a late period, while in epilepsy there is loss of consciousness at the onset or very early in the attack. Idiopathic epilepsy is a functional disease, but Jacksonian epilepsy is due to some coarse lesion in the brain, as a gumma or some syphilitic deposit which irritates the cortex in its neighbourhood, and sets

up the epilepsy. The fits are accompanied by some temporary paresis of the affected limbs.

In *feigned epilepsy* the typical form of severe epilepsy is always imitated. The tongue is not bitten, and urine and fæces are not passed involuntarily. The pupils are not dilated and insensible to light at the beginning of the seizure, nor is there at that time any pallor of the face. The malingerer takes care not to injure himself when he falls, and there is no loss of sensory perception. There is no first epileptic stage and no albuminuria, which often appears after the fit is over. The frothing at the mouth is produced by a piece of soap in it. The conditions mentioned above as not being present in feigned epilepsy, are noticed in the severe forms of idiopathic epilepsy.

Eclampsic convulsions in infancy are distinguished from idiopathic epilepsy by the age of the patient; they are most frequent during the first two years of life, but after the fifth, and especially after the seventh year, are rare. The most potent cause is rickets, which occurs chiefly between the age of six months and eighteen months. At this time the lower centres of the brain are more advanced structurally than the higher ones, and so are less easily controlled. Hence a slight cause, such as dentition, worms in the intestines, or indigestible food, is sufficient by irritating the peripheral nerves to set up convulsions. Anything which produces a mechanical congestion of the brain, such as whooping-cough, will also set up convulsions. Occasionally the convulsions are partial in character, and laryngismus stridulus, or carpo-pedal contractions, that is inversion of the thumb and great toe, are only seen.

Usually convulsions in infancy are bilateral, but if they are unilateral they do not always appear on the same side, but affect sometimes one side and sometimes another. In idiopathic epilepsy there is, of course, no exciting cause such as rickets.

Puerperal convulsions occur before, during, or after labour. In a few cases they are due to an unstable state of the nervous system, and then are caused by labour pains or by the examinations by the medical man to see the progress the labour has made; but in most cases they are due to a large quantity of albumen in the urine. Idiopathic epilepsy, as a rule, does not occur during the puerperal state.

Uræmic convulsions are due to kidney disease which has so affected the blood that the urine contains a quantity of albumen and a deficient amount of urea. Generally the convulsions are more marked on one side than the other, and if they are unilateral they do not always affect the same side, but occur sometimes on one side, sometimes on the other. In idiopathic epilepsy there is no albumen in the urine, and a lessened amount of urea, which accumulates in the blood, as is the case in uræmic convulsions.

Other morbid blood states are those in which there is a presence of lead or alcohol circulating in the blood, or of some toxic poison as in the onset of acute diseases. The blue line on the gums, lead colic, atrophy of the muscles, especially the extensor muscles of the forearm producing wrist-drop, will be our guide when lead is the cause; in the case of alcohol there will be a history of drink or of a previous attack of delirium tremens, and the characteristic tremor which occurs only on movement, and which is seen in the arms, face, and tongue, and in the legs when the patient attempts to move them; while in the onset of acute diseases, the appearance of the disease strengthens the diagnosis.

Convulsions may occur from *active disease of the brain or its membranes*, such as meningitis, encephalitis, hæmorrhage, or softening of the brain, but are not likely to be mistaken for epilepsy. Chronic brain disease, however, may cause convulsions which resemble epilepsy. They usually are local in character, and only partial in range, but sometimes they are general from the first and may be easily mistaken for epilepsy. In that case it will be necessary to inquire whether there is persistent headache, any paralysis of the limbs or cranial nerves, vomiting, and optic neuritis. If these symptoms are present, we know that the convulsions are due to the brain disease, and are not idiopathic in character.

The convulsions which occur in *general paralysis of the insane* are distinguished by the trembling of the lips and tongue, and the mental change, which is evidenced either by delusions of grandeur, or by melancholia.

Hystero-epilepsy need not detain us long. It is very common in France, but less so in England, probably on account of our less emotional character. It commences with an aura, consisting of a sensation starting from the ovarian region and proceeding to the epigastrium and finally to the head, when the patient shrieks and falls in a state of unconsciousness. Then follow tonic and clonic convulsions, and finally a state of coma. This is the epileptic stage. The second stage is one in which there are violent contortions of the body, opisthotonus in which the body is arched forwards and rests only on the head and feet, or there are jumpings or somersaults. The third is the emotional stage in which the patient assumes an angry expression, which is soon followed by one of joy and happiness. After this there are various hallucinations. This is a brief account of the attacks as they occur in France, and the pictures I now show you represent the affection in a better manner than any description I can give of them. Pinching the skin in the inguinal region or slight pressure in the ovarian region will bring on an attack, while firm pressure over the ovary will cut it short.

In England the attack commences usually with a tonic spasm, followed by clonic movements, succeeded by opisthotonus, or alternate flexion and extension of the legs, or the patient passes soon into the violent movements, during which attacks of tonic and clonic spasms occur.

Hysterical convulsions are distinguished from epilepsy by the absence of dilated pupils, of a bitten tongue, and of loss of consciousness, all of which are present in idiopathic epileptic convulsions. In hysteria there is no scream or cry at the onset of the fits, which is not sudden; there is no asphyxia, and when the attack, which lasts longer than the epileptic one, is over, there is no stupor, but the patient sobs or cries. The convulsions themselves are very different, for instead of the tonic followed by the clonic spasm of true epilepsy, the tonic spasm is prolonged, and often consists of arching of the back, so that the body rests on the head and feet, and the clonic spasm consists of violent movements in which the limbs are thrown about in all directions. If we do not see the attack, we must be guided by the history of the case, the absence of the usual aura and the presence of the globus hystericus, or sensation of a ball in the throat, the gradual onset and longer duration of the attack, and the emotional state which accompanies or follows it. These symptoms are absent in idiopathic epilepsy. The chief difficulty arises when the epileptic attack consists only

of tonic spasm, or is of the minor form; but it will be found on inquiry that, though the commencement of the attack may resemble hysteria, there is a history of epileptic fits which have occurred previously. It is necessary also to remember that a patient may have true hysterical and true epileptic fits at separate times. This patient who I show to you began to have hysterical fits, and now has true epileptic fits.

The minor forms of epilepsy may be mistaken for *syncope* or for *giddiness*. There are cases in which the epileptic attack consists only of a short period of unconsciousness, and is not only called a faint, but is supposed to be one of that character. The absence of an exciting cause, such as would produce a faint, the sudden loss of consciousness, the presence of an aura, and the sudden return to consciousness with some mental confusion would show the case to be one of epilepsy; while if the onset of unconsciousness and the return to consciousness are slow, and there is much physical prostration, the pulse being with difficulty felt at the wrist, the patient is suffering from syncope.

With regard to vertigo, there is hardly ever loss of consciousness, but the giddiness lasts for a considerable time, and then slowly disappears. In epilepsy there is usually loss of consciousness, and the patient recovers rapidly, or is a little "lost" or "dazed" afterwards. In addition, there may be a warning and a passage of urine, both of which would point to epilepsy.

The *prognosis* of *idiopathic epilepsy* is bad as regards recovery, especially when there is impairment of the intellect, but considerable improvement usually takes place as the result of treatment. An exception must be made when the fits are so frequent that the "status epilepticus" has been established. In such cases the prognosis is always bad. The chief danger in epilepsy is with patients who turn over on their face during the fit, and are likely to be suffocated if the attack occurs at night.

The prognosis of *Jacksonian epilepsy* is unfavorable, because it depends upon organic disease of the brain; and if the tumour be out of the reach of operation, the result must be fatal.

As regards *hysteria*, the prognosis is favorable as far as danger to life is concerned, but at the same time complete recovery does not usually take place. If there is hereditary predisposition, and the hys

terical symptoms commence early in life, recovery is then almost hopeless. The same bad prognosis must be held in cases of hystero-epilepsy.

With respect to *eclampsia*, when it occurs in very young children there is danger to life, and the same is the case with uræmic convulsions, even in grown-up persons. Convulsions which come on in children who are cachectic or exhausted by diarrhœa are likely to prove fatal, and the prognosis is grave when convulsions appear in the course of an attack of scarlet fever and typhoid fever, or during the puerperal state if the kidneys have become profoundly affected.

The *treatment* of epilepsy consists chiefly in the administration of the bromides of potassium or ammonium in doses of twenty grains three times daily. The bromide rash will be avoided by combining three minims of liquor arsenicalis with each dose of the bromide. When the attacks come on at night, a double dose before the patient goes to bed will often prevent their occurrence. If the bromides fail, borax either alone or in combination with the bromides in doses of fifteen grains will prove useful. Patients should be made to understand that, though the fits cease under treatment, full doses of the bromide must be continued for at least two years after the last fit, and even then the drug should be administered in lessened doses for another year. In some cases the attacks can be arrested, especially when they begin by a motion or sensation in the hand or foot, by applying a ligature around the arm or leg above the seat of the spasm or sensation. Rubbing the affected muscles or preventing their contraction will sometimes arrest the fit. During the attack the patient should be laid on the ground or a bed, and the clothes loosened around the throat. As to the diet, I am of opinion that meat should not be permitted, at least for a time; my experience here so far leads me to believe that the exclusion of it does aid in reducing the number of fits. An examination of the eyes should also be made to see if there is astigmatism, which causes eye-strain, and so acts as a reflex cause of epilepsy. If astigmatism is found, the error must be corrected by the use of appropriate glasses. In cases in which there is a history of syphilis, either congenital or acquired, iodide of potassium in combination with the bromide will prove beneficial. I had a case under my

care for two or three years, which never had a fit from the time of his commencing to take the iodide; and this little patient whom I show you was brought into the hospital for operation as there is a depression in the skull, but as there was a history of syphilis it was determined to try the iodide first, and the fits have already been much reduced.

With regard to *Jacksonian epilepsy*, if the tumour is superficial it should be removed by the surgeon.

The treatment of *eclampsia* depends in most cases upon the removal of the cause. If it is due to the gum being tightly stretched over a tooth, lance the gum; if constipation is the cause, give an enema of half a teaspoonful or a teaspoonful, according to age, of glycerine; if it is due to diarrhœa, administer an enema composed of starch, with half a teaspoonful of brandy, and three or four drops of laudanum; if worms be the cause, give an authelmintic; and if undigested food, administer a purgative. During the convulsion the clothes should be loosened round the neck, and chloroform should be inhaled. This last treatment should be applied when convulsions are due to the puerperal state, uræmia, and morbid blood states. After the convulsion is over, bromide of potassium should be given in all the above-mentioned cases, as well as in eclampsia occurring in brain disease, and in general paralysis of the insane.

The best treatment for *hystero-epilepsy* is bromide of potassium, but for *hysterical convulsions* a cold douche of water to the face will be most effectual. During the intervals between the convulsions valerian and assafœtida should be administered, and in severe cases the patient should be removed from home and placed under the Weir-Mitchell treatment, which consists in keeping the patient in bed and applying massage and the faradic current daily to the muscles. In this way the muscles become exercised; and the patient is also made to take a quantity of food in an easily digested form. As a result fatigue is avoided, and the patient gains strength and becomes stouter.

I will close this lecture by saying a few words about the way in which patients are admitted as colonists into the *epileptic colony* at Chalfont. You may have patients who, in consequence of repeated fits, are unable to get any work, but are anxious to work if it can be obtained for them. I happen to be one of the physicians to the colony,

and will tell you how to gain admission for such patients. You should apply to the secretary of the National Association for the Employment of Epileptics, under whose direction the epileptic colony is, at 12, Buckingham Street, Strand, London, W.C., and ask him to send you forms similar to these which I now show you. These should be filled up, and returned to him. Then if the executive committee are of opinion that the patient can be admitted, the case is referred to the medical committee, who, if they think the patient is a suitable case, recommend the man or woman for admission. The patient's name is then put down for admission, and he or she is admitted when their turn comes. The colonists are employed in farm work chiefly at present, but as the numbers increase, different trades will be added. Patients are not admitted as colonists if they are not strong enough to do active work; if there is irritability of temper, which does not allow them to live in harmony with their fellow-inmates and conform to the rules and regulations of the institution; and if they are imbecile, demented, and liable to dangerous impulses. The leaflets which I now distribute to you will give you some idea of the objects and aims of the colony.

Treatment of Sympathetic Ophthalmia by the Extract of the Ciliary Body of the Ox.—

Louis Dor has been led by theoretic considerations, including the idea that sympathetic inflammation of the eye results from an altered composition of the intra-ocular fluids, to try the effect of the instillation into the conjunctival sac of an organic extract prepared by macerating the ciliary body of the eye of the ox. He reports the case of a man who was attacked with sympathetic ophthalmia one year before, and in whom removal of the exciting eye, and subsequent active treatment, including mercurial inunctions and injections, and iridectomy, had failed to prevent blindness, with pain and hyperæmia of the eyeball. The regular instillation of the extract of the ciliary body was followed by great improvement in all his symptoms, his improved vision allowing him once more to find his way alone.

In another case of less severe sympathetic disease the improvement under the same treatment was equally noticeable.

Gaz. Hebdomad., Ann. 44, No. 50.

IN WHAT CASES AND WHEN TO ENU-CLEATE IN INJURIES OF THE EYE.

THERE is probably no class of cases that fall to our care that give us the same amount of anxiety and solicitude as to the probable and possible outcome, as that which occurs in the injuries, especially in the penetrating wounds, of the eye. The experience of years and a large number of cases does not enable us to say with any degree of precision, this case will have sympathetic oph-thalmia, or panophthalmitis, or that that case will not. We know that in a certain class of accidents, especially in those where there has been deep, penetrating wounds, more particularly in the ciliary region, serious results are liable to follow, and they often do. But, on the other hand, how frequently we note the termination of these un-favorably appearing cases in kindly healing, without the slightest untoward symptom ; no irri-tation of the fellow eye, and even a better result in the injured one than we had any expectation of seeing.

It is precisely this uncertainty, and the dreadful consequences that are liable to follow these in-juries, that lends this subject an intense and con-tinuous interest, giving it a respectful hearing at all times. If we could feel sure that any age, sex, or condition gave an injured eye exemption from the liability of affecting its mate, we could have the comfort of feeling secure in at least a small percentage of our cases, but unfortunately we know of no such exemption. Our clinical experience has not given such assurance, but, on the contrary, has shown beyond doubt that age, at least, has a bearing and not a favorable one ; for we have ascertained that children under the age of puberty are more prone to sympathetic ophthalmia after injuries, than at any other period of life. We have not been able to go further, however, and deter-mine any time at which there is any degree of immunity. The question is not the amount of safety age affords, but one that asks us at what age we feel the most anxiety.

Naturally, the first point of interest in any accident to the eye would be the character, and,

secondly, the location of the injury or wound, affecting as they do our prognosis and treatment to such an extent as is hardly the case in any other part of the body. Slight superficial injuries, such as are produced by blows with the fist or a dull instrument, causing contusions and bruisings of the coverings and appendages of the eye without solution of continuity of the ball itself, while they frequently are productive of serious or fatal results to vision, are in the rarest of instances followed by sympathetic affection of the uninjured member. Indeed, so seldom do we find even a sympathetic irritation from this class of injuries that we content ourselves by bearing in mind the possibility of a complication, and concentrate our attention upon the alleviation and betterment of the injured eye. Under these circumstances, that is, with no pain, irritation, or photophobia, we would hardly give the subject of enucleation serious consideration, bearing in mind also the large number of even severe injuries of the eye that are not followed by sympathetic ophthalmia; only two occurred in something like six hundred cases, thus allowing us to discard a large percentage of cases from the subject in hand.

It is a far different matter, however, when we deal with a penetrating or poisoned wound, even if the instrument or particle producing it is *not* left in the globe. Its presence, nevertheless, adds that much more to the gravity of the case; while a demonstration of its absence, which is not always an easy matter, does not give a sense of relief or a feeling of security. In any event, we have a serious condition before us, which is influenced by several factors, viz. depth, position, and character of the wound, as well as the presence or absence of a foreign body—all serious questions, de-manding serious consideration.

Our prognosis and method of procedure will be modified or entirely changed oftentimes by the position of the wound almost alone; that is to say, when we find a gaping, lacerated wound in the region of the ciliary process, we consider the case very much more serious and more likely to demand stringent proceedings than if it is in the conjunc-tiva somewhat remote from this situation. We can, I feel, be governed by the following : all things considered, a wound in the ciliary region more often demands enucleation than in any other locality, and that we should not hesitate in these

special cases to do the operation if there is excessive pain, indication of purulent inflammation in the affected eye, or if there is irritation, shyness of light, corneal haziness or discoloration of the iris, however slight, in the uninjured eye. The question of a foreign body in an eye renders the probability of an enucleation more probable, but is not *per se* an indication for the operation.

The question of a poisoned wound, one with undoubted contamination with bacteria of any description, demands, as a rule, enucleation. I do not suggest this with the belief in my mind of the migratory theory of sympathetic ophthalmia; on the contrary, I am convinced that the only way for trouble to be started in the second eye is by means of the intimate relations between the lymph channels and spaces, the irides, &c., as shown by the majority of cases exhibiting a serous uveitis, punctate keratitis, which confirms me in the belief that a sympathetic ophthalmitis does not arise from a migration of bacteria through the optic nerve. In sympathetic ophthalmia, staphylococci and streptococci are occasionally found in both eyes, but are not the specific cause of the disease, as shown by our inability to reproduce it by inoculation. It is caused more probably by the irritation of the ciliary nerves producing a reflected disturbance of the blood and nutrition of the uninjured eye.

In panophthalmitis, microbes are plentiful, as one would naturally suppose, streptococci, staphylococci, and varieties of micrococci, with marked infiltrations of the ciliary body and œdema of the papilla.

However, it is not the purpose of this paper to discuss the merits of the different theories of the origin of the trouble; my own belief in the matter is expressed to explain in a measure my position as to the best methods of dealing with or against the disease, finding, as I have done, that section of the nerve does not replace enucleation as a preventive measure against sympathetic ophthalmia.

We must bear in mind that this disease is a rare one, and as our operations are mostly done as a prophylactic measure against its onset, or done in cases that have been blind for months or years, it renders our statistics inexact, especially as a sympathetic ophthalmia occasionally sets up after an enucleation has already been done. In this connection I will say that experience has proven that in these cases the inflammation is less virulent than that which occurs when the operation has been too long delayed.

In what cases to enucleate.—Give the operation serious thought in penetrating wounds of the ciliary region, but do not do an operation for every ciliary wound. Enucleate regardless of the situation of the wound in cases where there is marked inflammation of the injured eye, and photophobia in the other; also when panophthalmitis is threatened.

The time to enucleate is as soon as possible after deciding it is necessary.

It is seldom that a prophylactic enucleation is followed by a sympathetic ophthalmitis; on the other hand, cures are at times established in cases where the symptoms have been well marked for several weeks. As a rule, however, in case the trouble has commenced, the primarily affected eye should only be removed after the inflammation has been so severe and lasted so long that there can be no hope of restoring vision. If sympathetic ophthalmitis affects the sound eye shortly after an enucleation of the injured, we feel certain that ill-defined and veiled symptoms have been overlooked and it had already begun to suffer before the operation was performed.

Where the inflammation follows after long delay, how can we account for it? As an example note an atrophic globe following an old injury, absolutely quiescent for years, when suddenly an inflammatory action commences, and the fellow eye is lost with sympathetic trouble.

In panophthalmitis an early enucleation should be done for fear of meningitis following. This dreadful sequel has commenced as late as the twentieth day, but generally begins much earlier. We all know and recognise the deformity resulting from the lack of development of the orbit in a child, following enucleation, but this should not deter us from the operation in all suitable cases, for we must feel some pangs of conscience if sympathetic ophthalmitis occurs in a case that we have not operated on for cosmetic reasons. I am strongly inclined to lean toward the operative side when my first examination, shortly after the accident, leads me to feel positive that no sight will be regained in the eye.

MEDICAL LEGISLATION.

Mr. Brudenell Carter, Mr. Victor Horsley, and the General Medical Council.

MR. VICTOR HORSLEY, on December 8th last, publicly expounded and proved that by the Acts of Parliament under which medical practitioners worked, the only qualification is registration; that medical practitioners were entitled to practise medicine, surgery, and midwifery, because they are registered, and that was their statutory guarantee. If the Acts of Parliament meant anything at all, they meant that " the man in the street" who was not registered was not entitled to practise. Mr. Brudenell Carter, on January 12th, read a paper to the South-West London Medical Society, and explained that his offer of the paper was called forth to refute Mr. Horsley's views. Though Mr. Carter spoke at considerable length, it is difficult for any unprejudiced person to understand in what way he even attempts to touch upon the position taken up by Mr. Horsley. Mr. Carter detailed with much clearness many facts which everyone is agreed upon; for instance, he pointed out that medical grievances were intensified by the increasing number of medical men, that the result of increased knowledge was a curtailment in the number of cases of illness and their length, that fees were inadequate, that suicide had increased among medical men, that the General Medical Council had scarcely more to do with governing the profession than ruling the courses of the stars, that the Council only met twice a year, and so on. Mr. Carter must either have been too angry with his opponent to see the futility of his remarks, or it must be concluded that he considers a string of inconsequential admitted facts a sufficient reply to a mere direct representative of the practitioners of England and Wales on the General Medical Council. In regard to this latter point, it was significantly remarked by one of the audience that it was known from Mr. Carter's published statements that such representatives were regarded by him as an unmitigated nuisance, and that there were already five too many. The obvious conclusion arrived at by the meeting on the 12th was that nothing had been advanced in opposition to Mr. Horsley's position, but that in place of argument Mr. Carter had substituted abuse, and to such an extent did this employment of vituperation carry Mr. Carter, that one of the speakers commenting on Mr. Carter's early life in general practice, on which he dilated in his opening remarks, took occasion to deprecate the use of strong language.

Copying, then, Mr. Carter's plan of leaving Mr. Horsley's position untouched, it is of interest to consider some of the statements made by Mr. Carter, not because they at all bear upon the strength and soundness of Mr. Horsley's views, but because we have every reason to believe Mr. Carter's views are those of certain members of the medical profession whose high position invests these reactionary prejudices with dangerous importance. Every effort made by Mr. Horsley to protect the incomes of medical men from the attacks of prescribing chemists, foreign doctors, quacks, and such-like unregistered persons, has always been met by the answer " it is not possible; " and that reply having been given, every care has been taken that the incorrectness of the statement should not be admitted. Mr. Carter's opinion that as a political force the medical profession is powerless, and that Parliament will not take any step in the further suppression of quackery, or protection of the medical profession, must surely be taken as a hasty expression to be subsequently modified. It must be perfectly patent to everyone that in protecting registered persons by suppressing unregistered practice, the public reap the greatest benefit. Mr. Carter considers it impossible to exaggerate the depth of gratitude which the Council owes to its legal advisers. Of course, as Mr. Carter's opinion is that the General Medical Council has scarcely more to do with the profession than it has to do with the courses of the stars, it must appear to the ordinary practitioner that whatever depth this gratitude may reach, the matter is of very little importance when brought forward as an argument to provide specious reasons and excuses for the existence of illegal unregistered practice.

The central dramatic incident of the meeting was Mr. Carter's reference to what had occurred at the Council when sitting *in camera*, in order that he might make a personal attack on Mr. Horsley's knowledge of the law. The case out of which this arose was a momentous one. The legal advisers had advised the executive committee to put upon the dental register three unqualified dentists, and the executive committee, relying on the statements of the legal advisers in regard to the Dentist Act, especially section 37, had ordered this to be done. Mr. Horsley, however, drew attention to the matter, and showed the grave consequences of the whole proceeding, with the result that the Council decided at his instance that the registrar was not to carry out the orders of the executive committee; in other words, the opinion of the legal advisers was by the fortunate intervention of Mr. Horsley not acted upon. No incident can more strongly emphasise the justice of Mr. Horsley's contention that the next vacancy of a Crown representative should be given to a dentist.

Mr. Carter took credit to himself for having successfully laboured for the profession in many ways, notably by his literary efforts. He omitted, however, to

mention any particular reform or benefit the profession has gained by his work; and as we are wholly unaware of his having achieved anything of the sort, we shall be very glad to receive some indication of what he has accomplished. On the other hand, we do know that Mr. Carter has spoken of his brethren in general practice in the very strongest terms concerning direct representation. We are also aware that Mr. Carter for a long time strove to persuade the medical profession that the Medical Acts afforded them no protection against unregistered practice until Mr. Horsley demonstrated that his position was untenable.

It must be a matter of congratulation to Mr. Horsley to know that in his honourable and uphill struggle on behalf of registered practitioners against unregistered practice, the only public opposition as yet encountered has consisted of much verbiage chiefly remarkable for the lack of argument.

GOLF TOURNAMENT (under Handicap). Open to qualified medical men.

Play to be under the following conditions:

Match Play—local rules of green to hold good. Competitors will be notified of result of each draw; first draw to be on Monday, 24th inst. Each couple to arrange time and place of their match, within 30 miles of London if one party wish. Entries by 22nd inst.

Intending competitors to send name, address, and lowest handicap, with the entrance fee (five shillings) to the Hon. Sec., Golf Tournament, Rosedene, Windlesham, Surrey.

Committee: Dr. Ernest Clarke, Dr. W. R. Dakin, Mr. C. T. Dent, Mr. Howard Marsh, Dr. Laidlaw Purves, Sir Thomas Smith, Bart., Mr. F. C. Wallis, and the Hon. Sec.

THE CLINICAL JOURNAL.

CONTENTS.

A POST-GRADUATE CLINICAL LECTURE ON CYSTOCELE.

Delivered at Charing Cross Hospital, Nov. 25th, 1897,

By AMAND ROUTH, M.D., B.S., M.R.C.P.,

Obstetric Physician with care of Out-patients, and Lecturer
on Practical Obstetrics and Gynæcology at the Hospital;
Physician, Samaritan Free Hospital for Women
and Children.

LADIES AND GENTLEMEN,—On a previous occasion I gave a lecture on the inflammatory diseases of the vagina, and now I propose to speak of vaginal displacements, occupying myself mainly with displacement of the anterior wall.

The vagina may be looked upon as the duct for the excretion of uterine discharges, and, of course, also for reproductive functions. In the infant the vagina is a functionless organ, and though its mucous membrane is sufficiently moist, it is devoid of all glandular activity, and is for all practical purposes without function. Its anterior and posterior walls are in contact; lying transversely, therefore. But its orifice is vertically placed, with the folds of the hymen pointing out, and forming a vertical slit. After puberty the vagina takes on a very definite function of its own, apart from its being merely the uterine duct. There is little or no mucin secreted from the vagina itself, but it secretes a lympho-serous fluid, which is thin, perfectly transparent, and colourless (apart from inflammation), and is invariably, in the healthy adult, acid. Until bacteriology came into general use, it was not known to what this acidity was due. It is now known that it is due to a vaginal bacillus which is always present in the healthy adult, which bacillus is inimical to the presence or prolonged existence of streptococci or staphylococci; the two cannot exist together in any quantity. This bacillus is known to be the cause of the acid reaction; because when cultures are made of the vagina bacillus, lactic acid is thrown off in sufficient quantities to make it quite certain, from chemical reaction, that it is lactic acid. In chronic diseases such as we are considering, these vaginal bacilli are often absent. During married life the vagina has again a further function, and gets widened out, and its folds more or less obliterated. It also becomes more active as regards the secretion of the glands which are present at the vulvar extremity. In old age the vagina atrophies, like other generative organs, and becomes shortened, partly by the absorption of fat at the orifice of the vulva, and partly by the closing in of the upper end with associated atrophy of the cervix.

The best way to look upon the vagina in its relation to the cervix uteri is to consider that the lower part of the uterus dips down into the vagina, and that the vaginal mucous membrane, with its stratified epithelium, covers over that portion as a thimble would cover a finger, so that the whole of the vagina, including the vaginal portion of the cervix, is covered by this pavement epithelium.

Now the subject of to-day's discourse, cystocele, involves a knowledge of the above stated facts, and also some knowledge of the attachment of the vagina. I have some diagrams here for your inspection. The anterior wall of the vagina is attached to the cervix-uteri, so that so long as the latter is in a good position the vaginal wall

cannot become displaced downwards. The base of the bladder and the vagina are attached to one another by connective tissue, loosely it is true, but yet so firmly that when the anterior vaginal wall comes down, the bladder invariably comes down also. The urethra is practically in the anterior vaginal wall, and at the anterior extremity of the vagina it is associated with the pubic arch and the infra-pubic triangular ligament. In addition there are the two ureters, which come down from under the base of the broad ligament, one on each side, near the cervix, and then turn upwards in the vaginal wall to the base of the bladder. So that the anterior vaginal wall is pretty firmly attached to the surrounding tissues all the way along. I have said that when the anterior vaginal wall sags down in the pelvis, it draws down the bladder with it, and in this differs from a prolapse of the posterior vaginal wall, where the rectum is not necessarily drawn down with it. I chose the subject *cystocele* because it is one of the most common conditions we have to deal with, at all events in women who have had children or are engaged in laborious occupations. I show you a specimen embodying the best post-mortem example of cystocele in the museum. It is an instance of elongation of the supra-vaginal cervix, associated with, and probably secondary to, the cystocele.

Causation.—A cystocele may be *primary* or *secondary*. It may be *primary* in two distinct ways, and in this connection it is desirable that I should say a word as to how the bladder behaves during pregnancy and during the lying-in period. During the first two and three months of pregnancy the uterus is a little bit lower in the pelvis, and the bladder is slightly depressed in consequence, and there is sometimes a little pressure on the neck of the bladder, causing some disturbance of that organ's function. When the uterus rises up out of the pelvis and rests on the brim, there is a more definite pressure on the fundus of the bladder, and frequency of micturition may result. Towards the end of pregnancy, again, the lower zone of the uterus broadens out and the head or presenting part comes down, so that at this period also there may be some pressure on the neck of the bladder. When labour commences, the lower zone of the uterus goes on being distended, and with it the bladder, which is attached to this part of the uterus. As labour progresses the bladder

is more and more drawn up out of the way of pressure, and comes to lie entirely outside the true pelvis.

Primary cystocele may result from a prolonged or difficult labour, where there is a great deal of stretching of the anterior vaginal wall, especially if that labour is followed by retention of urine, for the bladder then bulges down through the stretched vaginal fibres, and cystocele is very apt to result, more particularly if prolapsus uteri also ensues.

There is another way in which cystocele is primarily produced, and I think it is more common than the last. Supposing the membranes rupture early, before the cervix is well dilated ; the head then forms the dilating medium, and the anterior lip of the cervix is forced down in front of the head, dragging with it the anterior vaginal wall and the bladder. The ureters are inserted into the portion of the bladder which is thus drawn down, and if pressure is very marked against the pubes, urine goes on being secreted into that lower prolapsed portion of the bladder, causing further bulging downwards, and the formation of an acute cystocele may result, the upper part of the bladder above the pubes being practically empty. Such a cystocele would add to the obstruction which the œdematous anterior lip was already causing.

Secondary cystocele is a much more common variety than primary ; at any rate that is my impression. Secondary cystocele can be produced in
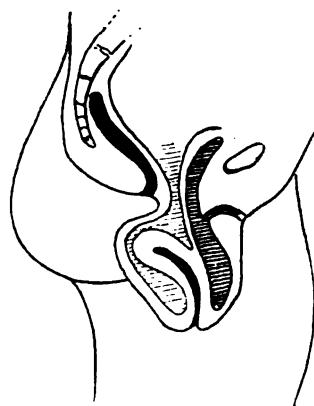
Fig. 1.

several ways. It is certainly predisposed to by a deficient perinæum, for the anterior vaginal wall is supported to a certain extent by the opposition of the posterior vaginal wall, and especially in its

anterior part, where it definitely lies against the perinæal body. Again, a very common cause of cystocele is prolapsus or procidentia uteri (Fig. 1). When the uterus comes down, necessarily a cystocele results, because the vagina is inverted and the bladder is dragged down with it; and that becomes, in all probability, the most trying symptom to the patient, much more trying than the ordinary slight prolapse which is the cause of it. This is more particularly the case if there is a retroversion of the uterus.

There is another cause of cystocele which has not been much noticed; namely, hypertrophy of some slight difficulty also, and she may even have to push up the protruding mass, as otherwise she would not feel as if the act was completed. Sometimes the trouble is not frequency or difficulty, but it is incontinence. If it is a well-marked cystocele with some prolapsus uteri as well, she will state that when she coughs, or laughs, or strains suddenly, there is a tendency for the urine which is in the cystocele to be forced out by the sudden increase of intra-abdominal pressure.

In such a case there is usually also a urethrocele, with a little dilatation of its orifice and protrusion of the urethral mucous membrane. Often,
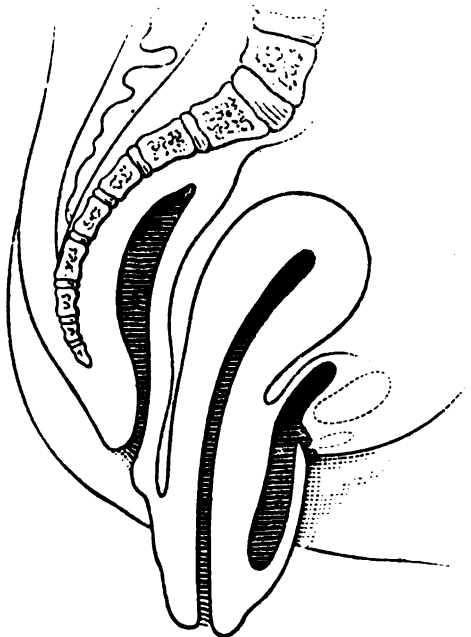
Fig. 2.

the supra-vaginal cervix. If this part of the cervix is hypertrophied, and the fundus uteri remains at its proper level, the cervix descends in the direction of least resistance, and eventually protrudes, dragging with it the bladder, which is closely attached to that part of the uterus. It is not often that hypertrophy of the supra-vaginal cervix occurs as a primary condition; but when it does, cystocele must necessarily result.

The *symptoms* of cystocele are few. First of all, a woman with slight cystocele generally complains of some irritability of the bladder, some frequency of micturition; occasionally she will complain of however, there are no urinary symptoms, and women merely say that the womb comes down and protrudes, complaining mainly of bearing-down pain. On examination one finds that the protrusion is the anterior vaginal wall, with or without a prolapsus uteri.

Now the *secondary results* of cystocele are very marked. The first one I want to speak of is *elongation of the supra-vaginal cervix.* We have seen that this is sometimes one of the primary causes of cystocele, but the elongation of the cervix is then a true hypertrophy rather than a mere elongation by stretching. If the body of the

uterus is fairly well fixed by its ligaments, the cystocele will draw down that portion of the uterus to which the bladder and the anterior vaginal wall are attached, and supra-vaginal elongation of the uterus results.   More than half the observed cases of cystocele are associated with more or less of this supra-vaginal stretching, without a true prolapse of the uterus at all.   In such a case you can generally feel by bimanual examination the fundus uteri at or about its proper level.   The vagina is shortened both in front and behind the cervix

demonstrated frequently in our out-patient room. It has a very practical bearing on treatment.

Another result is *urethrocele*. In the majority of cases the posterior half of the urethra is alone prolapsed, but sometimes the whole urethra comes down so that the bladder sound has to be passed at once downwards into the cystocele. Sometimes only the floor of the urethra descends. The sound at once easily reveals the exact curve of the urethra.

Another result of *cystocele* is *cystitis*. It is per-
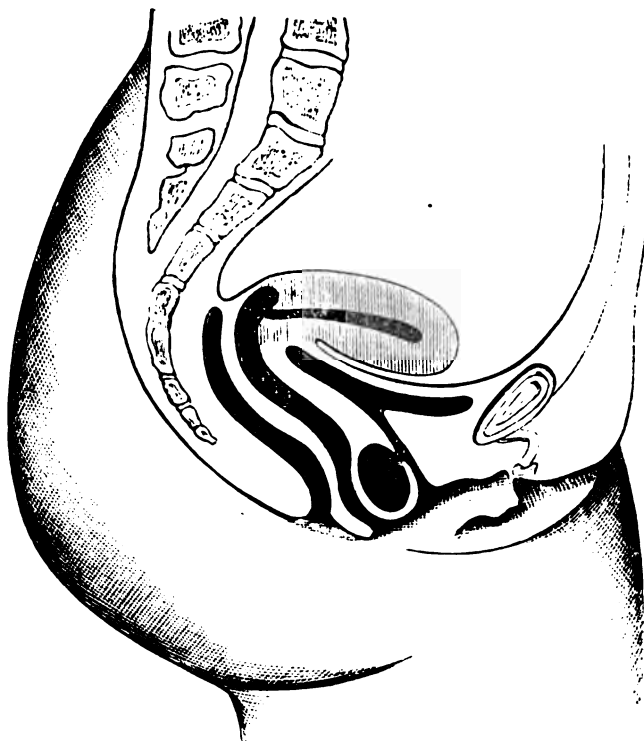
Fig. 3. (From ' Obstet. Soc. Trans.,' by kind permission.)

uteri, and in some cases both cul-de-sacs are obliterated.   In this diagram (Fig. 2, from Schultze), Douglas's pouch is shown to be drawn down outside the vulva by the stretching of this part of the cervix.   When you pass the sound you find it goes in perhaps 5 inches, and you may feel the top of the sound behind the pubes.   If you now push up the cervix and cystocele, you will find the supra-vaginal elongation has disappeared, and the uterus would now measure perhaps 3 or $3\frac{1}{4}$ inches, and even less than that in a few hours' time if kept elevated.   That has been

haps the commonest cause, apart from dirty catheters, of cystitis in women.   Cystitis in women does not result much from gonorrhœa and urethritis.   As a sequel of cystitis in cystocele, a phosphatic calculus may be formed.   I show you one specimen of a five-ounce phosphatic calculus, which I removed by vaginal incision from a woman who had a very old-standing cystocele, with cystitis. In this case there are also phosphatic deposits on the bladder wall.   As a result of prolonged cystitis, retrograde changes take place in the kidney ; therefore the cystitis ought to be promptly treated.

Vaginal incision with drainage may cure very chronic cases.

The *diagnosis* of cystocele has to be made from any tumour which bulges from the anterior vaginal wall. One is urethrocele, already alluded to, and another is urethral diverticulum (Fig. 3), which is well depicted in the picture I pass round to you. The condition is fairly common, but is rarely recognised. It is a retention cyst formed by one of the glands at the floor of the urethra. It gradually becomes distended, and may be as big as an egg. It eventually opens into the urethra, generally as a result of parturition, and then urine trickles into this, and it becomes an abscess containing putrid urine, and discharging an extremely offensive irritating pus. It is a very painful condition. Urethral diverticulum is very like cystocele, but it is distinguished from it by the fact that when you pass the sound along the urethral floor it dips down into the sac through a relatively small orifice. You draw off perfectly healthy urine from the bladder, yet pus is found in the urine passed naturally. If you squeeze the sac, purulent offensive urine comes out. There are also other vaginal cysts, such as those which are formed from the distension of persistent and patent Gärtner's ducts. These are, as a rule, slightly to one side of the urethral ridge.

Now as to the *treatment* of cystocele. It is not an easy condition to treat. Sometimes the cystocele persists in spite of anything you can do ; but in a good many cases one can relieve the patient very much. Your success depends very much upon whether it is a primary or secondary cysto-
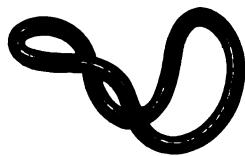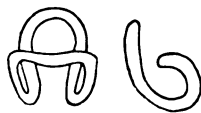
Fig. 4.   Fig. 5.

cele, and on whether the uterus is truly prolapsed, or whether there is an elongation of the cervix associated with it as a cause or effect. In all cases one generally first tries to relieve with pessaries. One of the best forms of pessaries is an india-rubber Hodge, boat-shaped, with one limb behind the cervix, and the other end well tilted up and curved (Fig. 4), or a sledge pessary (Fig. 5), or Wells' pessary (Fig. 6), or Galabin's (Fig. 7). These

are only satisfactory if there is a definite cervix to prevent the back limb slipping forwards, and
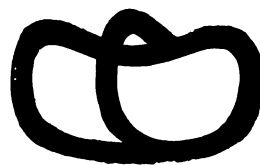
Fig. 6.   *Montague.*

Fig. 7.   *Montague.*

therefore they usually fail. Ring pessaries rarely succeed. Some form of "cup and stem" pessary, such as Napier's or Cutter's with adjustable bands,
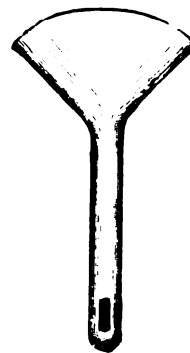
Montague.

may be tried where operation is negatived. They can be made to answer in most of the chronic cases of cystocele, but in young women their use involves great discomfort. We should always aim at keeping the uterus at a high level, and in an anteverted position.

As regards operations, the old method of treating cystocele was by scarring the vaginal wall, and encouraging it to contract by cicatrisation. Then anterior colporrhaphy was introduced, which involves removing strips of mucous membrane, of varying shapes, from the anterior vaginal wall, and then drawing the resulting free edges together, puckering up the exposed bladder beneath. This procedure was usually very unsatisfactory and temporary. Sometimes one can do good, in addition to an

anterior colporrhaphy, by restoring a deficient perinæum at the same time, to act as a support to the anterior vaginal wall, especially if we combine with it a posterior colporrhaphy to narrow the vagina. That does not cure the cystocele, but it prevents it coming outside and enables a pessary to be worn. Lately I have been trying other means, and one of the best of them is to make a longitudinal incision along the anterior vaginal wall and strip off the bladder, as is done in anterior colpotomy. Two loose folds of vaginal tissue result, which can be everted and, instead of being cut off, raised up into a vertical ridge, by suturing it to a piece of perforated celluloid, prepared beforehand. A rigid wall is thus formed.

This does not give way like the cicatrices in colporrhaphy, but really seems to be a better groundwork to resist further pressure.

If there is retroversion with prolapse of the uterus, as there very often is with a cystocele, there is no operation which answers so well as the comparatively new one of anterior colpotomy with anterior vaginal fixation of the uterus. The incision is made transversely in the front of the cervix as in vaginal hysterectomy, and another incision is made longitudinally along the anterior vaginal roof, as far forwards as the neck of the bladder. The bladder is then stripped off the anterior vaginal wall, and off the front of the uterus, and is pushed up behind and above the pubes. The anterior pouch of the peritoneum is opened, and the uterus is anteverted from its retroverted position, sutured to the vaginal walls along the longitudinal incision, after all redundant tissue has been removed. The result of this operation is better than that of any other I have tried. I remember well a case which had been operated on by others. She had had very marked procidentia uteri, with cystocele. Her vagina had been narrowed by various colporrhaphies; her cervix had been amputated; she then had Alexander's operation for shortening the round ligaments; and then ventro-fixation was performed. As a result the uterus kept up, but the cystocele came down as before. In that case, after separating the bladder entirely from its connection with the vagina and with the uterus, and having sutured the vagina to the still elevated uterus, the cystocele disappeared, and appears to be permanently cured.

In cystocele with elongation of the supra-vaginal cervix, failing some relief from a pessary, the only possible thing to do is to amputate the cervix high up; it is useless to do anything else, because the bladder is in these cases attached along the uterus for about three inches. The bladder anteriorly, and the peritoneum posteriorly, must be separated as high as you intend to amputate, and it may also be desirable to tie off and divide the base of the broad ligament on each side. This is more particularly necessary where there is permanent hypertrophy as well as elongation. Amputate after splitting the cervix laterally, and treating each lip as a separate flap, pushing the bladder right up, and stitching the vaginal walls to the anterior and posterior stump of the uterus. By that means you should leave a normal-sized uterus, with part of its supra-vaginal cervix, and with its vaginal connections intact. The results in the cases I have seen are extremely good. Uncomplicated cystocele in old women often requires no treatment.

A LECTURE

ON

A General Survey of the Anatomy and Physiology of the Ear, from a Clinical point of view.

Delivered at the Central London Throat and Ear Hospital, Gray's Inn Road,

By J. DUNDAS GRANT, M.A., M.D., F.R.C.S.,

Surgeon to the Hospital.

PART I.

LADIES AND GENTLEMEN,—The somewhat cursory description which I propose to give you to-day of the anatomy and physiology of the organs of hearing will differ in some respects from that with which you are already familiar from your anatomical studies. For a candidate for examination my account will, I fear, be at the same time incomplete and redundant. For instance, you will not find me dwelling upon the microscopical structure of the organ of Corti, but I shall refer fully to one or two matters which are barely mentioned in the books on anatomy to which most of us have been accustomed to apply.

The organs of hearing may be roughly divided into (a) percipient and (b) conducting. Now, in a sense, the percipient part of the organ of hearing may be said to be situated in the auditory cortical centre, in the superior convolution of the temporo-sphenoidal lobe. Still, for clinical purposes it is found convenient to make a different division, and to look upon the percipient portion as starting in the labyrinth and ending in the auditory cortical centre, the conducting portion consisting of all which lies to the outside of that; namely, the auricle, the meatus, the membrana tympani, the tympanic cavity with its contents, the ossicular lever, and the foot-plate of the stapes. Perhaps it would be more exact if we were to say that the percipient portion starts with the hairs of the auditory cells in the organ of Corti. I show you a diagrammatic representation of the organ of hearing. Note first the chain of bones ending with the stapes. On the inner side we have the percipient portion of the auditory apparatus—the labyrinth with the endolymph and perilymph, the semicircular canals, the cochlea, and the auditory nerve running through the internal auditory meatus onwards to the junction of the

Diagrammatic representation of the organ of hearing.

medulla and pons in the brain, and so to the auditory cortical centre.

Hearing is interfered with when disease occurs in the inaccessible percipient portions, or in the accessible conducting portions. When it is in the percipient portions we have what we clinically term "nerve deafness," to which subject I have to devote a special lecture. When it implicates the conducting portion we call it "obstructive deafness.

Now, I may remind you that at the peripheral extremity of the auditory nerve there are cells, such as I show you here, bearing hairs at their apices,
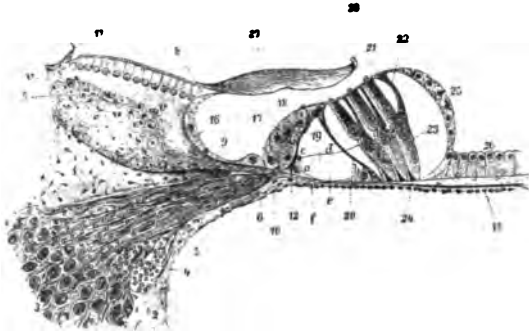
Cells (21) at the peripheral extremity of the auditory nerve bearing hairs at their apices (Schwalbe).

and that these are modifications of the ordinary terminals of sensory nerves. But the nerve endings in the ear are modified for the reception of certain particular stimuli, namely, tactile stimuli of very slight force, but of a fairly considerable degree of rapidity. The frequency in the human subject is from 14 to about 40,000 per second. Impulses of this rate, from whatever vibrating body they may issue, produce sensations of sound. But the auditory nerve is affected by other stimuli. There are hair cells, not in the cochlea, but more particularly in the ampullæ of the semicircular canals, which are exposed to tactile stimuli when the liquid in which they are bathed is moved relatively to the rest of the body, so that when the head or the body is moved in space the movements of the liquid in which the cilia are bathed communicate to them certain obvious mechanical stimuli. We have thus the sensation of the change of position produced in certain of the cells connected with the auditory nerve. This is illustrated quite constantly in our clinical work, because we find that in disease of the auditory nerve one of the symptoms is the greatest possible disturbance of equilibrium with which we are acquainted, and we see it in the vertigo, characteristic of so-called "Menière's disease," also of what I shall describe to you as "pseudo-Menière's disease."

To begin at the outermost extremity of the organs of hearing, we shall start with the *auricle*, which I shall not describe in full, but point out to you. A number of names are applied to the different

features of this part, and these are apt to be troublesome, but if you take them somewhat methodically there is no great difficulty. For in-

The auricle.

stance, the deepest part of the auricle is called the *concha*—shell-like. Then curling round it you have a sort of screw—the *helix*, and opposite this the *anti-helix*. The latter is peculiar in having two limbs like a Y (the most confusing feature of the auricle), the one limb running forwards and the other straight upwards. If you observe this

Satyr's ear (exaggerated).

representation of a deformed ear you will bear the points better in mind. It is the kind of ear one sees in the Satyr, where there is a point at the very top, this point being the continuation of the upper limb of the anti-helix. It is to be distinguished from the Darwinian ear, where you have an exaggeration of the Darwinian tubercle.

Darwinian ear.

Then there is the *tragus* in front, so called from the goat, because in many people it is thickly coated with hair. The part opposite it is called the *anti-tragus*. If you take the parts as I have indicated you will find little difficulty, and I may finish up by reminding you that the skin on the back of the auricle is looser than on the front; while in the lobule there is no cartilage, so that this part is exempt from perichondritis.

Next comes the *external meatus*—the passage leading from the exterior to the membrana tympani.. I show it in horizontal section, also in vertical.

Horizontal section of external meatus (Bonnier).

You see the outer part of it is cartilaginous, the inner osseous, and it is peculiarly curved, somewhat in a screw shape. But before I touch upon that I might mention that the cartilage is a funnel-shaped prolongation of the auricle inwards, and it is "stuck on" to the rough edge surrounding the orifice of the osseous meatus. In the upper and posterior part the cartilage is lacking. These details may appear trivial, but they are important in operating. The length of the meatus along its posterior wall is found to be about 24 mm., *i. e.* 1 mm. short of an inch, measuring from the well-marked angle turning over from the concha into the meatus to the posterior attachment of the membrana tympani. This also must be kept in mind, because in using the probe you have to be very careful when you get beyond the 24 mm. The curvatures are of

Vertical section of external meatus (Bonnier).

very considerable importance, especially in connection with the examination of the ear and the removal of foreign bodies. The passage is somewhat spiral; in the right ear the spiral is very much like that of a right-handed corkscrew, being directed inwards, upwards, somewhat backwards, then forwards and downwards. In the left ear it is like a left-handed screw. The diagrams I show you illustrate this. In a vertical section the meatus runs upwards and then downwards; in a horizontal section, if you start from the tragus you see that it runs forwards, then backwards, and then forwards again. The narrowest part of the meatus is the junction of the outer and middle third of the osseous portion, and there is a narrow part just at the entrance. The two widest portions are just inside the orifice, and close up to the membrana tympani. This is well shown in the specimen which Mr. Lake has prepared. You see that when a foreign body is in the meatus it may easily be pushed past the

isthmus into the bay shown in the diagram, and the dangers connected with its extraction then become considerable. Another point is the convexity of the floor of the meatus, which is well brought out in this vertical section, although not so marked here as one often sees it in nature. It is of great importance, because if you have a thin layer of cerumen plastered upon this convexity, to all outward appearance it looks like a ball, and if you take a sharp hoe for the purpose of pulling it out, you are certain to scrape very painfully into the skin of the meatus unless you keep in mind that the layer you have to remove may be a very thin one.

When we wish to straighten the meatus, we cannot change the osseous part, but we can alter the relations of the cartilaginous portion to it. You can easily see how that is done, namely, by taking hold of the auricle and pulling it upwards. In the horizontal section you see how the tragus obtrudes upon the view. When you pull the auricle upwards and this part backwards you bring it still more over the orifice of the ear, so that to complete the manœuvre you have to move the tragus forward with a blunt hook or speculum. The skin or lining of the meatus is beset with *ceruminous glands.* You would naturally think these analogous to sebaceous glands, but they are not ; they are found to be modified sweat-glands. They extend over the whole of the cartilaginous meatus, and to some extent into the osseous. Like other sweat-glands, their secretion is stimulated by the administration of pilocarpine. When cerumen is secreted to an excessive degree the normal course is for it to be gradually worked outwards by each movement of the lower jaw, and the excess can then be wiped away, but some people, from a mistaken idea of cleanliness, push corners of towels and instruments into the ear to extract the cerumen, instead of which they simply force it further in.

With regard to the direction of the osseous meatus, it runs, in general, forwards and downwards ; that is to say, its posterior wall is an extremely oblique one, so that the inner section of the osseous meatus is not exactly opposite the external one, but considerably further forward, and you may, in your operations, form for yourselves a very good idea of the position of the posterior margin of the tympanic membrane if you remember that it is in a line with the middle of the outer orifice of the osseous meatus. This is a useful landmark.

Below and in front of the meatus there are a number of lymphatic glands, the parotid gland, and the temporo-maxillary joint. There are some fissures in the meatus. The relation of these parts to the temporo-maxillary joint has to be kept well in mind, because when people lose their back teeth, and especially when the lower jaw acquires the curvature which is due to advancing age, the angle becomes less distinct, the condyle of the jaw is driven closer up against the meatus, and pushes it backwards, so as to narrow it into a somewhat vertical slit, such as is often seen in elderly people. I shall not go into all the possible relations, but remind you particularly that it is separated from the cranial cavity by a thick layer of bone, which very often contains a number of air-cells and cancellous spaces. Behind the cartilaginous meatus there is aponeurotic and connective tissue, covered by the wide attachment of the auricle. It is difficult when you look at the wide attachment of the auricle to the skull, and think of the very small section of the cartilaginous meatus, to realise what there is between these. Behind it you have a lymphatic gland on the surface of the mastoid, which is sometimes inflamed, and often mistaken for mastoid disease. The retrahens auris muscle forms a fold running horizontally backwards from the inner surface of the concha very prominently displayed when the auricle is drawn forwards.

The osseous meatus has also behind it a part of the groove for the lateral sinus, usually at a considerable distance, but in other cases extremely close. This is an important and serious relation to keep well in mind. Behind and above its innermost part it has a portion of the mastoid antrum, and very often disease extends through the partition from the mastoid antrum to the meatus.

(*To be continued.*)

Dermic Sarcoma in the New-born.—Dr. Jacobi reports a case of giant-cell sarcoma of the skin in an infant of seven months. The tumours, which were small, occurred at the upper left part of the scrotum. They were bright red, not adherent. The inguinal glands were not involved.
Medicine, January, 1898.

MEETING OF THE SOCIETY OF ANÆSTHETISTS,

At 20 Hanover Square, December 16th, 1897.

The President, Dr. DUDLEY BUXTON,

in the Chair.

MR. WALTER TYRRELL read the following paper entitled "On the Addition of Ether Vapour from a Second Bottle during Chloroform Administration by Junker's Apparatus."

LADIES AND GENTLEMEN,—We cannot have a Dudley Buxton or a Leonard Hill every night, and so it comes to pass that I am called upon to fulfil an undertaking of more than a year ago to come up for judgment when requested. It has been no wish of my own to press my fads and fancies upon you, but your secretaries inform me that I am really wanted to-night to fill a vacant place, and so I am here in the hope that my short paper may lead to such discussion as will make the evening an interesting one, if not as instructive as many that have preceded it.

One has only to read the medical papers to learn that if we only knew how to give gas and ether properly, we should never require chloroform for any but tongue and jaw cases. The writer generally concludes by saying he never has any difficulties with ether. When I read these letters I feel like Mr. Underwood, who was instructing a student at the Dental Hospital of London how not to break a tooth in extracting it, when the student remarked that he never broke a tooth; and Mr. Underwood said, " I am sorry for you, your experience hitherto must have been extremely small;" and this is what I feel when a man rushes into print to say he never has any difficulties with ether.

I have been administering ether for twenty-one years, and I must confess that I have not yet arrived at that happy state of perfection which I sometimes read of; and it is on account of this that I have been led to try other methods in certain classes of cases which do not do well with ether alone.

I think it is about six years ago that a paper appeared in the 'British Medical Journal,' in which this statement was made :—" Ether increases the anæsthetic effect of chloroform, and *vice versâ* ; therefore it is wrong to inject ether subcutaneously in chloroform poisoning." Now, I believe this observer to be right in theory, but the conclusion that it was wrong to inject ether in chloroform poisoning is certainly wrong in practice, and for this reason, that most of our alarms from chloroform are not due to the true anæsthetic effect of the drug upon the brain, but occur early in the administration, and are at any rate partly syncopic—due, as I think, to the direct action of the chloroform upon the heart ; and there are few of us who would mind increasing the true anæsthetic effect if by injecting a little ether we can keep the heart going. I differentiate between the syncopic effect of chloroform and the true anæsthetic effect. I have always had a prejudice against the A.C.E. mixture, having a strong feeling that the stomach or rectum is the right place for the A., and that it was impossible to know before you commenced the administration what proportions of chloroform and ether would best suit the case which you were anæsthetising ; and thus I was led to my "double bottle method" by which I can give chloroform and add ether as required for the particular case under treatment. Moreover, some of the cases which do not do well under ether do not bear well any closed inhaler, and by Junker's inhaler plenty of air is admitted. Some cases do very well with a closed inhaler for a short operation, but the heart becomes extremely rapid and feeble if the operation extends to an hour or more, though only ether may have been used. There are sometimes big fat women who are distinctly short of breath on walking into the operating room. The medical attendant tells you the heart-sounds are normal, but you can feel no impulse, and on putting your ear over the cardiac region you hear sounds very like a baby's heart-sounds a few weeks old, and your patient says she cannot breathe unless she has three or four pillows. Others are not fat but flabby, look older than their years, have a small soft pulse, and the same short abrupt heart-sounds. These are among the cases which do very well for a short operation under ether ; but when the etherisation is prolonged, notwithstanding every possible care to allow as much air as is compatible with good anæsthesia, the patient gets grey and the pulse small, feeble, and very rapid. The explana

tion of this I believe to be that the hearts to begin with are very poor things, and the ether acts upon them like whipping a tired horse and whipping him under very adverse circumstances. These patients suffer from chronic oxygen starvation and difficulty of breathing through the irritation of the air passages caused by the ether. For this class of case I have frequently used the double bottle method, either from the beginning or after administering ether twenty minutes or so from a Clover's inhaler. Since Midsummer (and as I was away during August and September it is not yet four months) I have been anæsthetising these patients with a little preliminary nitrous oxide gas, then ether from a Clover's inhaler with a very small continuous stream of oxygen into the face-piece from a Brins cylinder with a regulator. This method was also dictated by my theory of heart failure from chronic oxygen starvation, but it is too new to say much about it, nor would it come within the scope of this paper, although in passing I may say I am very favorably impressed with it, and so far it tends to strengthen the oxygen starvation theory.

Now besides those cases in which the A.C.E. mixture is commonly considered the most suitable anæsthetic, there are many others in which chloroform is usually administered, and for which I find the double bottle method suitable. In these it is not always necessary to add the ether vapour from the beginning, and it may not be necessary to use it at all; but it is a great comfort to have it connected with your apparatus, ready to be turned on at a moment's notice should any pallor or shallow respiration occur. It may be thought that in a patient who was rather faint, and whose respiration was shallow, the turning on suddenly of ether vapour might produce a spasm of glottis, and so abolish the little respiration that was going on. But this is not so in practice. In the first place, really very little ether is necessary to produce the desired effect, and you have the strength of the vapour completely under your control; and secondly, I never give an adult a vapour stronger than I can quite comfortably inhale myself, and children of course very much more diluted, so that if you proceed carefully, instead of getting a spasm of glottis, the breathing and colour gradually improve. You must remember that you can at any moment stop the chloroform and

continue with ether, or *vice versâ*, and proceed with a combination of both vapours in varying strengths.

The operation of circumcision in infants and young children is specially suitable for the combined vapours, because the degree of anæsthesia has to be rather profound. I know of no one operation which has produced a greater number of alarms than this one; partly, perhaps, because the skilled anæsthetist is not considered necessary, and partly because they are not easy cases to anæsthetise satisfactorily. The conjunctiva is quite insensitive, the surgeon proceeds, the little patient kicks, more chloroform is poured on, and syncope ensues.

Operations for removing the isthmus or lateral lobes of the thyroid gland, where the enlargement has so pressed upon and diminished the calibre of the trachea as to have produced dyspnœa, are suitable for this method. Some surgeons will expect a patient, suffering from dyspnœa from the pressure of a goitre, to breathe under chloroform in a posture in which it was impossible for them to breathe before the anæsthetic was given; therefore it is most important not to produce any degree of syncope. The small amount of ether added by my apparatus does not irritate the air passages more than chloroform alone, and it certainly stimulates the breathing as well as the circulation.

Operations upon glands of the neck in young children are suitable cases for this method, and in older children if the operation involve the deeper structures. The respiratory difficulties caused by ether in children, and the consequent engorgement of the great veins of the neck, make some surgeons prefer chloroform for these operations. In the later stages of these cases being able to add a little ether vapour, and so diminishing the amount of chloroform necessary, has often been a great comfort to me.

For the removal of portions of ribs for thoracic empyema, and for searching for foreign bodies in the lungs and air passages, I have found this method useful, as well as for a number of other surgical procedures.

I ought to add that for some eye operations, especially iridectomy for glaucoma, when the patient is generally feeble, and yet it is important not to produce such an engorgement of the blood-vessels of the organ as is often unavoidable with

ether alone, I have found it a great comfort, particularly in a very feeble old man aged ninety-seven.

To describe briefly the apparatus: it consists of two Junker bottles with all the modern improvements of Dudley Buxton, Carter Braine, and others. The india-rubber tubes are so arranged that one bellows works both the bottles, one of which contains chloroform and the other ether. Between the bellows and the bottles in the course of the tubing is inserted a Y-shaped piece with a little graduated tap on each bifurcation of the Y. The vapour from each bottle is again by a Y-shaped piece brought to a single tube, and thence to the face-piece. Before commencing an administration you adjust the tap leading to the ether so as to let only sufficient vapour pass through as you can inhale yourself without any discomfort, or in the case of a child much less than that. You leave this tap adjusted to pass the amount of ether you intend to use should any become advisable. You can then turn off the ether entirely by the tap on the bottle, and proceed to administer chloroform in the usual way.

Of course I know you will say that the method is complicated, but, as the sleight-of-hand man says—when you can't quite see his trick—"that is the beauty of it." An apparatus which takes up all your attention has its advantages. You cannot be watching the operation.

In conclusion, ladies and gentlemen, I beg to thank you for your attention. On second thoughts I think the title of my paper should have been "Heart Failure from Chronic Oxygen Starvation during or after Prolonged Administration of Ether." At any rate, this is the point I have had in view in making these suggestions. No one believes more than I do that it is the man and not the apparatus which is wanted. At the same time I agree with Mr. Mortlock, who said to me the other day, "Taking ether for an hour and a half is very hard work," and I feel there is plenty of room for improvement in our method. The direction in which I have been working may be quite wrong, but to quote from a recent speech of Lord Rosebery's, "A man who never makes mistakes never makes anything."

After reading his paper, Mr. Tyrrell went on to say that he had administered chloroform with this apparatus to Dr. Morris Grant, who he saw was present, when that gentleman was in a serious con-

dition with a temperature of 105°, with the happy result that the administration caused no sickness. He would agree with the statement that if much ether were required, his apparatus would not be of great use, for on much ether being passed through great cold would result, and difficulty would be caused. The physiological observer he had quoted from the 'British Medical Journal' made the assertion that a little ether increased the anæsthetic effect of the chloroform. When more ether was wanted it was possible to turn off the chloroform and give less chloroform, and thus go on with chloroform and ether. It was possible to commence administration with both ether and chloroform, but it took a little longer to get the patient under. This latter point might be objected to by some surgeons becoming impatient whilst waiting.

Dr. GRANT MORRIS said he had suffered from a bad attack of septicæmia, and having seen Mr. Tyrrell using his apparatus, and having used it himself in several hundred cases, he was anxious that in his case it should be used for him. He had had gas and ether three times before, and he always vomited so horribly on those occasions that he thought that if in the case in question he began to vomit again, his chance of recovery would have been diminished; he therefore begged Mr. Tyrrell to anæsthetise him with his double bottle apparatus. This administration he had had a second time later on. Those were the two occasions out of the five where he was not exceedingly sick. In regard to the apparatus, he had found it somewhat complicated; he did not consider it a good method for routine work, but in the cases specified by Mr. Tyrrell he had found it extremely useful.

The PRESIDENT asked how long anæsthesia had been kept up in the five cases.

Dr. GRANT MORRIS explained that there was about half an hour on each occasion.

Mr. EDWIN WHITE said he had watched his colleague using the apparatus for some time. In Mr. Tyrrell's hands it had been a great success. He had looked upon ether as a little salve to Mr. Tyrrell's conscience in chloroform inhalation. Primarily Mr. Tyrrell gave chloroform, but he utilised ether to add to the anæsthetic effect of chloroform, and for the purpose of stimulation. He was doubtful whether this had a scientific basis. He did not know if the ether did increase the action of the chloroform. He had himself

considered it as acting rather as a stimulant to the patient; and in old subjects he thought the administration of the two anæsthetics certainly useful. Mr. Tyrrell had been very successful, but he must not discount his own clever administration of chloroform. He considered that the apparatus was very useful on the account of its mechanism, but he did not consider the theory that ether increased the action of chloroform was proved.

Mr. JOSEPH WHITE said that the advantages of this double bottle method had been known for some time. The advantage of simply mixing ether and chloroform in different proportions, by means such that the proportions could be regulated, was an excellent idea, and the mechanism gave the power of using whatever proportion was wanted. There was an advantage in the use of the two fluids, but whether the ether increased the action of the chloroform, or whether the chloroform increased the effects of the ether he did not know. He had no personal experience of the apparatus of Mr. Tyrrell to enable him to speak on that point, but that there was an advantage in the combined method he had no doubt, from the result of hundreds of cases.

Dr. HAROLD LOW said he had used a Junker's apparatus, and dropped ether on the flannel mask; but the amount of ether could not be regulated in the same manner as it was possible from two bottles. The method of dropping the ether was simpler than the double bottle method. There was a drawback in regard to the freezing of the ether in the tubes of the apparatus, and he knew that Mr. Tyrrell tried many devices years ago to get over that point; and unless you had the ether running through in a very small stream indeed, there was danger of freezing. With adenoids he preferred to use the A.C.E. mixture; children took it well, and though they objected at the beginning, still he considered the mixture a good one. The question as to supplying oxygen with ether, he thought with Mr. Tyrrell ought to be worked out. In some cases, in administering ether the patients became exceedingly blue, and yet were not under the influence of the anæsthetic; and if you push the ether the trouble increased,—due, he thought, to the want of oxygen. But if you could add a slight flow of oxygen without raising the face-piece, it would, he believed, obviate much trouble in those

stout florid people that sometimes have to be anæsthetised. It was difficult to give an opinion on the subject of whether the ether increased the effect of the chloroform, as the matter had not been worked out enough.

Dr. AUGUSTUS COOK said he had seen chloroform administered by Mr. Tyrrell, and the patient was very easily got under; personally, he gave the A.C.E. mixture, and had given it for three hours at a time, and never had any difficulty, and he thoroughly believed in the method of giving chloroform by the Junker inhaler; and this plan of giving a little ether vapour, or replacing the chloroform, brought the administration to very near perfection. He thought, however, that the two bottles might be combined in one, thus doing away with the long tubes; and a regulating tap might be supplied, the same as in Dr. Dudley Buxton's apparatus, so that you could make a regulating inhaler to give a quarter or three quarters as wished.

Dr. SILK asked whether the small amount of ether used would be sufficient to show any distinct alteration in the cardiac action? Of course, that was a point which physiological experiment might help to elucidate.

Mr. CARTER BRAINE said that he frequently, in long operations for pharyngeal or jaw cases, added a little ether with the Junker apparatus whenever the patient became pale, with bad pulse; he added the ether to the chloroform already in the bottle. It had always answered well, the pulse had got much better, and he was firmly convinced that the addition of ether in some of these cases had been of great benefit to his patients.

The PRESIDENT said that he was sure they were all grateful to Mr. Tyrrell for having brought the matter before them in a plain and common-sense way. He was interested in hearing that Mr. Tyrrell had tried the combination of oxygen and ether. He had been for two years collecting material from his notes on this subject. He had used oxygen in this connection with the greatest satisfaction to himself, and he was glad to learn that Mr. Tyrrell had met with similar success. He hoped shortly to place his results before the profession. No doubt the apparatus of Mr. Tyrrell owed much of its success to the skill of the inventor, possibly if he had had less skill he would have made the apparatus more simple and more manage-

able, and no doubt with a little trouble the apparatus could be perfected, and he, for one, hoped that Mr. Tyrrell would undertake the task. It appeared to him to be unlikely that the ether acted altogether as an adjuvant to the chloroform, for he thought one found that in working with such mixtures the presence of alcohol and ether with chloroform tended to lessen the effect of chloroform rather than enhance it. Ether might increase the effect of the chloroform, and he thought the mixture produced a more prolonged anæsthesia, although of a less profound nature. One point he would have liked to hear from Mr. Tyrrell was in regard to the degree of anæsthesia he obtained by his method: whether the ordinary phenomena of chloroform narcosis were present, or were masked by the ether which was used; whether the ordinary chloroform pupil reaction existed, and what was the condition of the eyeball as regards fixation? In fact, were the phenomena those of the second or third stage of chloroform narcosis? There was no doubt, as Dr. Silk had said, that it would be interesting to work out the physiology of this method of giving chloroform with ether. He should have thought that *a priori* the throwing in of ether would act on the individual *quâ* the individual rather than *quâ* the chloroform.

Mr. TYRRELL replied that in regard to the physiology of the subject, it rather depended upon the physiology of the observer he had quoted from, and his views tended to corroborate his statement. He was afraid that the only strong evidence to bear him out was the fact that once when in a brain operation he did put on a little ether, Mr. Ballance, the surgeon who was operating on the brain which was opened, at once, within two minutes of his turning on the ether, said, "Are you using any ether; the vessels of the brain show distinct dilatation." Mr. Tyrrell thought that fact gave evidence that ether had a distinct effect on the vessels of the brain. The degree of anæsthesia was not so profound, the pupil became less contracted, and the eyeball tended to lose its fixation. With regard to the other effects of adding ether to the chloroform, he considered it certain that it counteracted the depressant effect of the chloroform; whether it was only by diminishing the amount of chloroform, which is often done when one throws in a little ether, or whether it was the direct effect of the ether, was a very difficult

matter to decide, and he had no means of determining the point. To that he could give no definite answer. If he had had the opportunity of going into those matters his paper would have been more valuable, and the Society would have had the paper before that evening.

THE WIMSHURST MACHINE IN X-RAY WORK.

BY

H. LEWIS JONES, M.D.,

Medical Officer in charge of Electrical Department, St. Bartholomew's Hospital.

THE Wimshurst machine has been recognised from the first as a possible source of electricity for exciting X-ray tubes, and various experimenters have tried it and reported upon it, but for the most part with doubtful results. So far as I know, the first valuable contribution on the subject is in Dr. Monell's book* published in America last year. There the author boldly asserts that the electrical machine is capable of giving results in X-ray work which are superior to any which can be had with the induction coil, and that it is especially advantageous for screen work, in that it gives a steady phosphorescence of the tube in place of the flickering light which is afforded by the induction coil. The book gave such evidence of a practical knowledge of the subject that after reading it I wrote to Mr. Wimshurst asking to be allowed to try some tubes upon his large machines, and he most kindly placed them at my disposal, and also devoted two whole evenings to working out the question with me. The results were so good, and confirmed Dr. Monell's statements so fully, that I at once determined to have a machine, and to get one specially built to stand hard work. The machine figured was built for me by Mr. Schwind, of Tolworth, near Surbiton, after we had had several consultations together upon the subject of the design. The frame is of light steel tubing, with four glass plates, thirty-six inches in diameter, mounted on gun-metal hubs and running in ball bearings, and they are driven by an electro-

* 'Static Electricity for X Ray and Therapeutic Uses.' Beverley Harrison, New York.

motor, or the machine may be fitted with a crank and turned by hand. The results for X-ray work are very good. It easily excites all the tubes which I have tried it on, and does it so well that with the fluorescent screen at a distance from the tube of eight or ten feet the bones of the hand can be plainly seen. The tubes are lighted up with brilliancy and steadiness, and there is far less noise than with an induction coil.

The working of the machine presents no difficulty; it has never failed to excite at once when set in motion, and the metal framework and fittings do not seem to impair its efficiency in the least. It is perfectly easy to make oneself familiar with the details of working a Wimshurst machine; and once these are understood, the fear that the machine may refuse to work when wanted becomes dispelled. The convenience of the Wimshurst machine for X-ray work is so great, that I believe the induction coil is likely to be superseded by it in the future.

The advantage of being able to generate the necessary electricity merely by turning a handle, without the need for any batteries whatever, seems to me to be of the utmost value, not only for those in country districts, but also for everyone who wants to use X rays. The only drawback there is to the apparatus is that it is not portable. Some of our readers will doubtless wish to know what is the smallest size of machine which is sufficient for practical purposes; and in dealing with this question I would begin by saying that it is always a convenience to have a little power in reserve. With a small machine the X rays produced may not be brilliant enough for good work, and I think that is the reason why some people have said that the Wimshurst machine, though capable of exciting X rays, is not so efficient as a coil. In England good electrical machines are very scarce, and they have not had a fair trial so far.

A little machine with two 18-inch plates can give an electro-motive force sufficient to excite a feeble phosphorescence in a tube of average resistance, and with eight plates of the same size the results are better, though still not good enough for real work; such a machine is capable of showing the bones of the hand on a screen, and of photographing them with an exposure of about two minutes, but is not of very much use for the thicker parts of the body.

A machine which I have seen with eight 24-inch plates works as well as mine with four 36-inch plates, the increased number of plates compensating for their smaller size; and two 36-inch plates would probably excite tubes very fairly well if driven at a rapid speed. With Mr. Wimshurst's great machine of twelve 36-inch plates the excitation is splendid for any tube, even when the machine is turned quite slowly; and here it is as well to say that increasing the speed of rotating the plates improves the output of a machine and tends to make few plates equal to a larger number driven more slowly. As the tendency of X-ray work is towards the use of higher vacua in the tubes, requiring higher electro-motive forces to excite them, I am disposed to prefer large plates, as they certainly give a higher E.M.F., and I think a machine with a few large plates is simpler to manage than one with more numerous plates of a smaller size. Dr. Monell, using a modified Holtz type of machine, the pattern which is chiefly used in the United States, recommends twelve plates of 30 inches, and I think myself that Mr. Wimshurst's machine with twelve of 36 inch gives finer effects than mine with only four of the same size; but his errs if anything on the side of being too strong, and tends to heat the anti-cathode, and so to lower the vacuum. So that twelve 36-inch plates probably provide more energy than is wanted. Four such plates certainly work admirably, six might be a little better.

My own machine is driven at from 120 to 200 revolutions a minute, and at that speed gives good results.

To ensure good working in the tubes the arrangement of the conductors is important, and I have found the gutta-percha covered wire known as "cable core" to be the best material for them. If the proximal ends are fitted into holes in the prime conductors, and the distal ends are provided with knobs, then there are no exposed ends of wire and no waste of energy by brush discharges. The conductors may be held in ordinary wooden clamps which I have fitted into a pair of bamboo flower-stands, as these make very convenient supports; they cost only two shillings each, and may be bought almost anywhere. They are tall enough to hold the wires at a convenient height for patients sitting at a table or reclining on a couch.

The kind of tube is also important. The Wims-

hurst machine works best through high resistances, as it can more readily meet a demand for higher electro-motive forces than for larger currents. The converse is the case with the Holtz machine.

For the production of X rays it is necessary to maintain a high potential difference between cathode and anti-cathode (anode). This potential difference tends all the time to equalise itself by a discharge from the one to the other, and this discharge or current is greater in a low resistance tube than in one of high resistance. Generally speaking, therefore, a high resistance tube is best for the Wimshurst machine, particularly when the machine available is small for the work. High resistance tubes have greater penetrating power than those with a lower vacuum. Experiment shows that a tube requiring a six-inch spark from a coil to excite it, or even a tube whose resistance is just growing too great for such a coil, is about right for the Wimshurst machine. The times of exposure for photographs with my machine are not so low as some of those given by Dr. Monell, who mentions a minute and a half as an exposure for the dorsal vertebræ! but they do compare favorably with the usual periods of exposure with the induction coil.
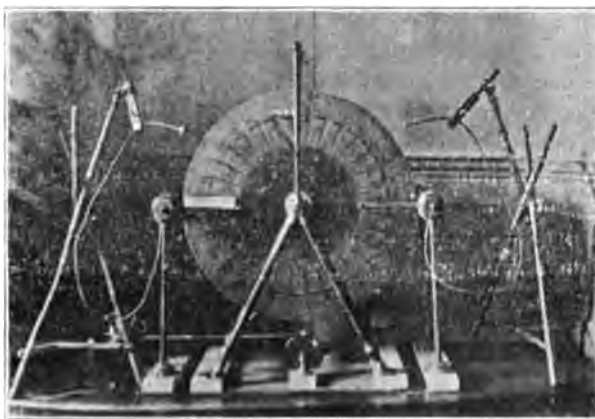
RARE COMPLICATIONS OF TYPHOID FEVER.

WHILE some medical men during the last few years have been largely interested in studying the value of recently introduced tests for the diagnosis of enteric fever, other clinicians have not been idle in studying this disease with particular reference to both its common and rare complications. More than twenty years ago one of the first and most valuable contributions to this subject was made by W. W. Keen in his 'Toner Lectures upon the Surgical Complications of Typhoid Fever,' and the information therein contained, combined with valuable facts derived from more recent statistics, was utilised in the address which this well-known surgeon recently delivered before the Alumni Association of Harvard University. In most instances the surgical complications of typhoid fever have arisen from the infection of bones or glandular structures with the typhoid bacillus and usually with other infecting micro-organisms, which have gained access to the body and lodgment therein chiefly because of the debilitated condition of the patient's system. Most of these surgical complications occur toward the end of the disease, or during convalescence from it, and naturally rarely require surgical interference until the febrile process has been arrested. There are other complications, however, of a medical character which have not been so carefully and exhaustively studied, and these consist not only in grave disorders of the intestinal canal, but also in nervous and lymphatic manifestations; and further than this it is a noteworthy fact that typhoid fever is an infectious disease which in no way protects,

either during its course or immediately afterward, the patient from other infections, so that other eruptive diseases may occur and various infectious processes may begin. An interesting complication of this kind, which seems to occur more frequently during the actual course of the disease than has hitherto been taught, is erysipelas, which, while it also quite frequently occurs during convalescence, seems to occur as a frequent complication during the progress of the disease itself. A number of interesting studies in regard to it have been published during the last few years, of which perhaps the most noteworthy is that of Gerente, who collected from various sources 3910 cases of typhoid fever, and among this number found that erysipelas had occurred as a complication of the acute stage of the disease, or its convalescence, in sixty-four instances, or in other words in the proportion of about one to every sixty-four cases. This observer also noted, in his Paris thesis for 1883-4, that females are more frequently affected than males, which is a fact worthy of note when it is remembered that males are more exposed and more frequently suffer from typhoid fever. Gerente also found that erysipelas as a rule made its appearance after the twenty-first day of the development of typhoid fever, and it is also a point worthy of recollection that some epidemics of typhoid have seemed peculiarly liable to this complication, probably because the streptococcus of erysipelas was present with unusual virulence, or else by reason of the fact that through lack of cleanliness of the mouth and nasal chambers solutions of continuity occurred in the skin and mucous membranes, making an opening by which the streptococcus gained admission to the subcutaneous tissues. This is the more likely when it is remembered that a very large proportion of cases of erysipelas complicating typhoid fever are of the facial form. It is also evident from Gerente's study that erysipelas occurs more frequently in the grave adynamic form of the disease, or in those in which the patient is exhausted by an unusually prolonged attack. He also believes that erysipelas usually produces a marked amelioration in the typhoid symptoms, provided that the inflammation is not situated about the face ; for when facial erysipelas develops the mortality at once becomes very high, there having been sixteen deaths out of thirty-six cases of facial erysipelas which were collected by

him. Probably it is only the phlegmonous forms of the disease which gravely imperil the patient's possibilities of convalescence, for in our experience the milder forms have certainly in no way seemed to delay it. Other cases have been reported by Armieux, Thielmann, and Berthoud. In Armieux's case a soldier was affected at the end of his second week of typhoid fever by a purulent otorrhœa, and three weeks later by a facial erysipelas which began in the auditory canal ; this was followed in a short time by an osteitis of the humerus, and this in turn by death. In Thielmann's case there seems to be some doubt as to whether the patient was really suffering from typhoid fever, as before admission to the hospital he was unconscious, and the greater portion of his face and forehead were covered with erysipelas. Recovery took place very gradually, but there seems to be reasonable doubt whether the case was not typhoid in type rather than due to real typhoid infection. In the instance reported by Berthoud there were marked meningeal symptoms during the attack of the typhoid fever, which were followed by very tardy convalescence, the patient's general condition being very unsatisfactory. At this time the scrotum and inguinal region became greatly inflamed and erysipelatous, all the lower portion of the abdomen being involved in the inflammation, and finally a portion of the scrotum became necrotic, death occurring from exhaustion. The autopsy showed that the iliac and renal veins were involved in a suppurative inflammation, secondary to the erysipelas of the skin.

In addition to this case, Freudenberger has recorded a case in which erysipelas appeared suddenly on both ears in the course of typhoid fever, and another instance of complicating facial erysipelas which was easily controlled, and from which recovery took place. Martinez has also reported a case of typhoid fever complicated by erysipelas of the foot and leg, but there seems to be grave doubt as to whether this was a true case of typhoid, or, in other words, whether the typhoid symptoms were not due to an erysipelatous infection. Finally, we find three cases reported by Hare and Patek, in which this complication occurred. In the first a well-defined erysipelatous inflammation appeared over the left side of the face during convalescence from typhoid, and seemed to be undoubtedly due to the fact that there was great soreness of the skin

‘about the lips and buccal mucous membranes, and as these became fissured and cracked they permitted infection. In the second case the erysipelas developed during the third week of typhoid about the bridge of the nose, and finally extended over the entire face back to the ears, and to the hair on the forehead. In the third case the erysipelas began as a complication during the third week of typhoid, and was also facial in type. It is interesting to note that all three of these cases occurred in women, thereby supporting the statement of Gerente, already quoted, that this disease as a complication is more frequent in this sex than in males. It is also an interesting point to note that recovery took place in each instance, notwithstanding the fact that the disease was facial in type, and that in no instance was the condition of the patient rendered much more grave by the development of the erysipelas. So far as we know, there has been no careful study of post-typhoidal insanity since the publication of Hutchinson's classic article in Pepper's ‘System of Medicine,’ which was published some thirteen years ago; but we know from Hutchinson's paper, and from other contributions to medical literature, that such a sequence to typhoid fever is by no means uncommon. In rare instances, however, insanity or mania has developed early in the disease, and not as a post-typhoidal manifestation, and in one case reported by Mottet, mania developed so early in the attack that the patient was sent to an asylum before the true nature of his disease was discovered; and Henrot and Bucquoy have seen the disease begin with the delirium of grandeur. Other cases of pre-typhoidal mania have also been reported by Murchison and by Daly. In both of these cases the mania developed as early as the fourth or fifth day of the disease.

NOTES.

Diet in the Febrile Diseases of Children.— The proper regulation of the diet is as important in the febrile diseases of children as the medicinal treatment. As it is more difficult to feed young children in health than to feed adults, so in disease the question of diet is not only a more difficult

one, but is also of greater importance. The infant often has a very slight hold upon life, and even when the disease does not seem serious it sometimes requires but a trifle to loosen it. When the child's life hangs in the balance, failure of the stomach to do its proper work may prove fatal. In any case it adds to the seriousness of the illness and delays recovery.

In the feeding of sick children, three errors are common—too frequent feeding and the administration of too much and of too rich food. The digestive powers are diminished by fever, even more in children than in adults. Less food, therefore, should be given in each twenty-four hours than in health, and it should be more diluted. It is a serious error to give milk to a sick child every few minutes. The child frequently takes it eagerly, not because it is hungry, but to allay thirst. It should not be forgotten that milk, while liquid outside the body, becomes a solid in the stomach, and is a tax upon the digestive power. When milk is given at such frequent intervals it often happens, when the critical period arrives, that the overburdened stomach refuses to do its work. Complete loss of appetite, and perhaps vomiting, indigestion, and gastro-enteritis, are added as a complication to the original disease. Simple loss of appetite, by depriving the child of the nourishment it so urgently needs, may in serious cases prove a fatal complication.

A careful record should be kept of the exact amount of food taken and retained during each twenty-four hours. The impressions of a nurse or mother are frequently so unreliable that the medical attendant can in no other way form a correct opinion as to the amount of nourishment his patient is getting. The importance of thus keeping a record of the quantity of food cannot be too strongly insisted upon.

As to the food to be selected in the acute fevers of children, the chief reliance may in most cases be placed upon milk, diluted according to the age of the child, and peptonized if necessary. Next to milk in importance are beef broth, mutton broth, beef juice, wine whey, and oatmeal or barley gruel. They should be given in amounts suitable to the age of the child, and, except when indicated for short intervals, the frequency of their administration should rarely be less than two hours.

Archives of Pediatrics, January, 1898.

Operation for the Prevention of Conception.
A woman who was still young had fallen into a state of grave anæmia after seven successive confinements, and Dr. Kehrer, professor of obstetrics and gynæcology at Heidelberg, performed the following operation, according to 'La Semaine Médicale,' in order to prevent further pregnancies. By a median vaginal incision he penetrated the peritoneal cavity; then drawing the tubes into view he placed around them two catgut ligatures. This done, he performed vaginal hysteropexy immediately above the internal orifice of the uterus, introducing into the vesico-uterine cavity a strip of gauze, and suturing the wound into the vagina so as to leave a small opening for the passage of the drainage. Apart from a little fever and slight supra-pubic pain there were no sequelæ. This process of artificial sterilisation possesses the advantages over castration of being a less serious operation, and of not bringing in its train the nervous troubles that double ovariotomy does. Dr. Kehrer thinks this could be done in certain grave affections (anæmia, pulmonary and cardiac lesions) which render pregnancy dangerous. He acknowledges that from a moral point of view the legitimacy of this operation could be questioned, and believes it ought not to be performed without the written consent of the parties concerned, and a statement of the motives for such intervention.—*Medical Record*, Jan. 8th, 1898.

REVIEW.

A Handbook of Therapeutics. By SYDNEY RINGER, M.D., F.R.S., and HARRINGTON SAINSBURY, M.D., F.R.C.P. Thirteenth Edition. (H. K. Lewis.) As pointed out in the preface to this edition, this remarkable volume is in point of fact a work on Clinical Therapeutics. If by work is intended to convey the larger meaning of the word, this book can legitimately claim to be regarded as not only a handbook, but a work of reference in regard to therapeutical matters. Though the authors declare that the indications for the use of drugs in disease are dwelt on rather than the physiological action, still the medical public on consulting the pages of the treatise under notice, will find that wherever physiological action is of paramount importance the authors have not failed to appreciate the position and properly accentuate the salient points, without burdening the reader with unnecessary detail. Although it must be admitted that the amount of use of a volume of this description depends more upon the way in which it is used than upon the exact method of arrangement of its details, still it is difficult to conceive how anyone could fail to derive most useful assistance from the study of this work; the reason for this being that the problem of stating clearly and concisely when to use a drug and how to use a drug has been grappled with so successfully, that it is not until one considers the question in some detail, that one begins to understand what an immense amount of labour and experience has been necessary to accomplish such a clever result. Attention must be drawn to a separate chapter in this work, which has been introduced on the subject of the new departure in medicine, viz. serum therapeutics, and a brief reference also is made to the Nauheim (Schott) treatment, a further new feature consisting of a short section upon the use of the digestive ferments in connection with invalid dietary. The authors must be congratulated on the production of the thirteenth edition of such a standard work, and the valuable method of making clinical considerations indicate or contra-indicate the employment of remedies will be sure to be appreciated. No praise is needed for good work of the description alluded to here, and in saying that no medical library is complete without this last edition, we are only doing the barest justice to this exceptional production.

Vi-Cocoa.—There is no doubt that there is ample justification for the statement that this preparation is invaluable as a food beverage. Cocoa, kola, hops and malt are pressed into the service of medicine, and the result is an excellent, nutritious, stimulative, and restorative food. For conditions of prostration from nervous and wasting complaints, this article affords a serviceable therapeutic agent.

CONTENTS.

A General Survey of the Anatomy and Physiology of the Ear, from a Clinical point of view.

A Lecture delivered at the Central London Throat and Ear Hospital, Gray's Inn Road,

By J. DUNDAS GRANT, M.A., M.D., F.R.C.S.,
Surgeon to the Hospital.

PART II.

I NOW come to the *tympanic membrane.* This is extremely thin, and is situated obliquely across the inner extremity of the osseous meatus. The specimen I pass round shows it very well. It consists of three layers, the outer one of which is cuticular, the inner one mucous, and continuous with the mucous membrane of the tympanic cavity; the middle one is attached to a cartilaginous limbus, and this has been proved by Mr. Lake to be continuous with the periosteum of the meatus and tympanum, and also with that of the Eustachian tube. The general surface of the membrane looks forwards, downwards, and outwards. So great is its obliquity that if light
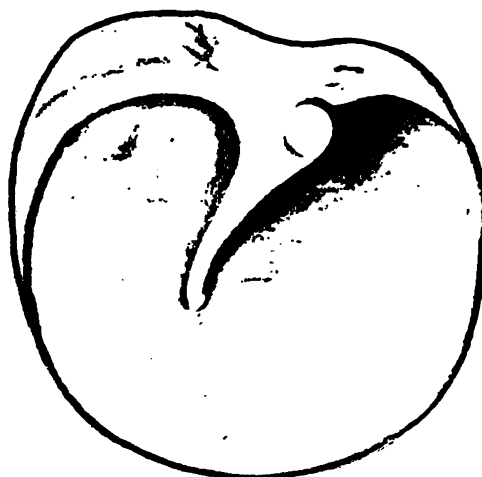
Tympanic membrane.

were thrown directly into the meatus on to the shiny membrane it would all be reflected down on to the floor and front wall of the meatus; none of
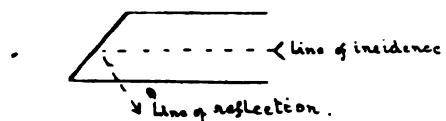
it would be reflected back to the eye. But the membrane has attached to it the handle of the malleus, which runs from its upper part almost vertically down to the centre. That bone is drawn in, and it draws in the centre of the membrane, consequently the portion below is more nearly vertical than it was, as is also the portion in
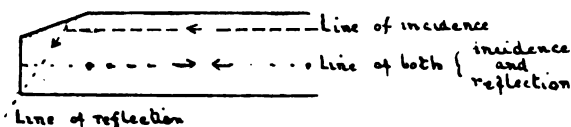
front. Putting these two together, therefore, there is a triangular space directly at right angles to the line of vision, and light thrown into the meatus is reflected back from the spot I show you, producing the "light cone" running from the tip

of the manubrium downwards and forwards. The *handle of the malleus* runs downwards and forwards ; but from the obliquity of the membrana tympani as you look in, it appears to run downwards and backwards. At its upper part there is the *processus brevis*, and running backwards and forwards from about that level are two *folds* of mucous membrane. The frame in which the membrane is fixed is incomplete above, and you can see in this specimen the little *notch of Rivini*. The part of membrane above this level has no middle layer, and is therefore very thin and flaccid. It goes by the name of *membrana flaccida*, or the *membrane of Shrapnell*. It conceals the neck of the malleus, and the head of that bone lies in the part of the tympanum which I shall describe to you immediately. With regard to *the shape of the surface of the membrana tympani*, it is certain that the fibres radiating from the centre in the middle or periosteal coat are convex outwards, so that the membrana tympani presents the shape of a somewhat shallow funnel with convex walls.

The *tympanic cavity* has a capacity such that it would about contain a haricot bean. The outer
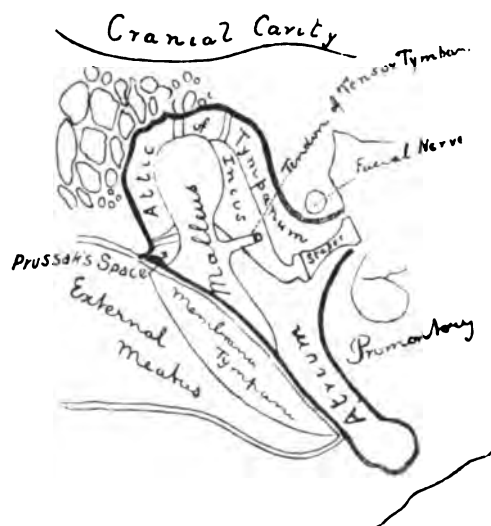
Transverse vertical section of the tympanic cavity (diagrammatic).

wall consists chiefly, but not entirely, of the membrana tympani, and I here show you a vertical transverse section of the tympanic cavity. I told you that the meatus is separated from the middle fossa of the skull by a thick layer of bone. The tympanic cavity is separated by a very thin layer

of bone. What about the difference in the thicknesses? It means that a large part of the tympanum is at a higher level than the upper margin of the membrana tympani, extending up to the middle fossa. This higher part is like the upper portion of a house, and is therefore called the *cupola* or *attic*, and its outer wall consists of bone, which lies above the level of the tympanic membrane. I ask your special attention to it because its thin roof is adjacent to the middle fossa of the skull, and you can readily understand how disease in the attic may find its way through that layer of bone and infect the temporo-sphenoidal lobe. It is the seat of disease which frequently shows itself by an abscess formation and perforation of the membrane of Shrapnell. The inner wall of the tympanum is also the outer wall of the labyrinth. This *promontory* I show you is the outer surface of the first turn of the cochlea. Behind it is a deep notch, which is very often seen clinically, and at the bottom, or rather top of it, is the little opening called the *fenestra rotunda*, which is covered by a miniature membrane, and opens directly into the lower part of the scala tympani of the cochlea. On it you see a groove, and there are generally several of them, for the ramifications of Jacobson's nerve and the tympanic plexus. At a short distance above the fenestra rotunda is the opening known as the *fenestra ovalis*. It is somewhat kidney-shaped, with its long axis anteroposteriorly. In it lies the foot-plate of the stapes. Further up still, on the inner wall of the tympanum, are the ampullæ of two of the semicircular canals, and below them the canal for the passage of the facial nerve in its course backwards. Clinically, these points about the labyrinth are important, because in the case of large perforations they are often exposed plainly, though often looked upon as something beyond human ken. Sometimes the promontory is so prominent that even a fairly experienced observer may think it is an osseous tumour or exostosis The *foot-plate of the stapes* lies in the window I show you, and round it is the *annular ligament*, which allows it to move freely, though only through a small extent. I cannot ask you too much to centre your minds upon the *stapedio-vestibular joint*. It is the pivot about which all the conduction of sound revolves, because the vibrations conveyed from the membrana tympani through the ossicles are impressed

upon it, and the impressions are communicated to the liquid in which the hair-cells of the auditory nerve are bathed. When this joint is fixed, as it sometimes is, by arthritic disease of one kind or another, we have a very slowly developing but steadily growing form of deafness, which is characteristic of sclerosis of the middle ear. It might be called progressive ankylosis of the stapes, which is certainly the bugbear of the aural surgeon. The *posterior wall of the tympanum* is complete as high as the level of the membrana tympani, but above that it is wanting. Thus it is a comparatively low wall over which you might jump, and if you did so you would be landed in the antrum. You may say what a capital thing it would be if that wall were removed, because disease kept up by fluids collecting in the antrum would escape readily into the tympanum. But we dare not remove that wall because in it lies buried the facial nerve, and removal would bring about incurable and absolute facial paralysis. On the posterior wall is a little conical pyramid containing the *stapedius muscle.* In one of the preparations I have sent round you see on the floor of the tympanum, to the inner side of the membrana tympani, a depression, the *hypotympanic space*, which is also very well adapted for the stagnation of fluids; there is no doubt that many serious and lasting forms of ear disease arise there. Just beneath that floor is a concavity for the *bulb of the internal jugular vein.* You very well know the tragic history of cases of thrombo-phlebitis of these veins. It has caused many of us to explore the lateral sinus and find nothing there, and yet the patient may die of thrombo-phlebitis and otitic pyæmia, the fact being that although the lateral sinus was free the jugular vein was infected, the thrombo-phlebitis was in the bulb, pus having made its way from the tympanum to this bulb. Very often this bulb projects into the tympanic cavity, and the partition being extremely thin, it has in some instances been punctured in paracentesis of the membrane.

The contents of the tympanic cavity are well known to you: the *malleus*, with its head and handle. You have, running forward, a very thin process, called the processus gracilis. The head has, on its posterior aspect, the surface for articulation with the incus. The malleus has various ligaments, particularly the *anterior ligament*, run-

ning along the processus gracilis. That ligament has been traced, by my indefatigable friend Mr. Lake, to its junction with the fibro-cartilage of the temporo-maxillary joint. (All these investigations lead us towards points of truth, although perhaps for the moment we cannot realise their significance in clinical work and pathology.) The *incus* somewhat resembles a two-fanged tooth, the crown of which articulates with the head of the malleus. Its long process runs downwards posterior to and parallel with the handle of the malleus. The short process runs backwards, to be articulated into the opening leading from the attic into the antrum, namely, the aditus ad antrum. The lower extremity of the long process of the incus is articulated with the head of the stapes. These bones form a sort of bent lever. (Although the processus gracilis has but little interest for us clinically, it has considerable interest from the point of view of development, as showing the connection between the malleus and Meckel's cartilage.) The *chorda tympani nerve* is another structure of interest. It comes out from the facial nerve through a small opening called the iter posterius, whence it runs forwards between the incus and malleus to the iter anterius, where it passes to join the lingual branch of the fifth nerve. (In an exceptional specimen of Mr. Lake's, the chorda tympani crossed both bones instead of passing between them.) The *stapes* is like any regulation stirrup, having a foot-plate and two limbs.

The *intra-tympanic muscles* are next of interest. The *tensor tympani*, which I show you, is a fairly long muscle, and lies in what you may remember as the uppermost tube of the double-barrelled arrangement pointed out to students as lying in the angle between the squamous portion of the temporal bone and the petrous portion in front. There is the tensor tympani muscle above, and the Eustachian tube below. Between them is the processus cochleariformis, which is continued into the tympanum until it comes exactly opposite to the short process of the malleus. The tendon then turns sharply at a right angle to be inserted into the inner surface and anterior edge of the handle of the malleus just below the level of the short process. It is supplied by the third division of the fifth nerve, by fibres which are supposed to pass through the otic ganglion, though

it is very doubtful if they do so. When this muscle contracts, it draws the malleus in with it, and thus moves the incus and drives the stapes inwards, and it may drive it in too far unless the stapedius muscle comes to the rescue. Pollak has shown that whenever the ear is exposed to a sound there is a contraction of the tensor tympani muscle. That is a well-established fact, but how it seems to be necessary for perfect hearing I do not think is at present quite clear. A curious point is that when this happens on one side there is simultaneously a contraction of the corresponding muscle on the other side—a synergic action,—so that when one
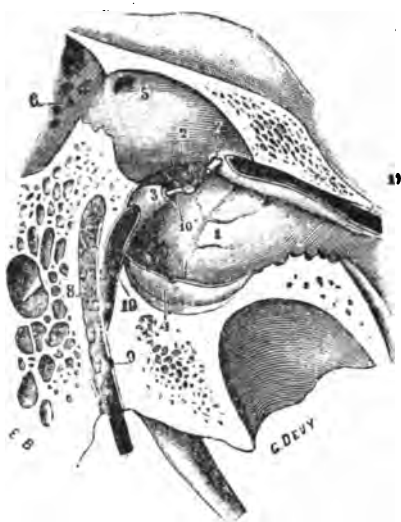
1. Promontory. 2. Fenestra ovalis, with the stapes *in situ*. 3. Pyramid. 4. Lower part of the tympanic membrane. 5. The aditus, from the attic to the antrum. 6. Antrum. 7. Tendon of the tensor tympani. 8. Acqueductus Falopii and facial nerve. 9. Chorda tympani. 10. Stapedius, and 10[1] its tendon. 11. Canal for the tensor tympani. To the right the tympanic cavity is seen to end in the Eustachian tube, below is the deep hollow for the bulb of the jugular vein.—TESTUT.

ear is exposed to sounds there is a contraction of the tensor tympani on the other side as well. The effect of such contraction of the muscle is to diminish the hearing on that side. Supposing the one ear is affected by disease, then the action of the two tensores would be ill-balanced, and the result would be excessive contractions occurring in the sound ear. In this way we may account for some of the injurious effect which disease of one ear seems to have upon the other. The *stapedius* muscle is supplied by the facial nerve,

and there is no doubt that it contracts whenever the ear is exposed to a loud sound, very much as the orbicularis palpebrarum does when the eye is exposed to light. The muscle is sometimes paralysed, because the branch of the facial by which it is supplied comes off from the main trunk very low down, and is implicated when the facial is paralysed from exposure to cold, with the following effect:—The safeguarding of the internal ear is no longer present, and patients complain bitterly of any loud noises, more especially those of low pitch. I have observed it in an engine-driver, also in the mother of a family of small children, accompanying facial paralysis.

The energy expended upon the malleus at its tip is communicated to the tip of the incus, and through it to the stapes, through a smaller space, but with a proportionately greater force.

I have referred to the *mastoid antrum*, and told you how it opens out of the attic of the tympanum through the aditus ad antrum. It lies in the petrous portion of the temporal bone behind the tympanum. Its outer wall is situated at a varying depth, but generally exactly internal to a triangle called the supra-meatal triangle. There is the osseous meatus, and you see the posterior margin as it is exposed in operation. Above it is the continuation backwards of the posterior root of the zygoma, which runs obliquely upwards. Taking that as one side of the triangle, and the postero-superior quadrant of the entrance of the osseous meatus as another, you join these by the tangent to the most posterior point of the margin of the meatus. If you work in from there, you will, in the largest number of cases, reach the mastoid antrum. It may be difficult to reach on account of the varying structure of the mastoid process. I show you here what is called the "pneumatic" variety, with numerous cells communicating with the antrum; and the "cancellous," which is more difficult to reach; while the condition most difficult of all is the "sclerotic," where the mastoid is intensely hard—like ivory,—in which, as a rule, the groove for the lateral sinus projects very far forwards. The mastoid antrum is also continuous with some of the cells of the mastoid process, which we call *cortical cells ;* and although in chronic disease the antrum itself is almost invariably affected, in acute disease it is often one of the cortical cells in which there is a focus of

suppuration. This cortical cell having got shut off from the antrum and from the other cells communicating with the tympanum, pus is pent up in it, and often gives rise to most severe constitutional disturbance, and even danger to life. It is in these cases that no time should be lost in chiselling open the cortical layer of the mastoid, which operation does not demand any very great skill as long as it is done with care. In this the operation differs very much from that required for

the chief one being the *tensor palati;* and it is during the action of swallowing that the opening of the tube takes place, a process which has been utilised by Politzer in his well-known method of inflation. The Eustachian tube is always partially open, so that there is always a certain amount of equality of barometrical pressure inside and outside the tympanum, but the pressure must be a little greater inside than out, otherwise the convexity of the radial fibres of the membrane could not be
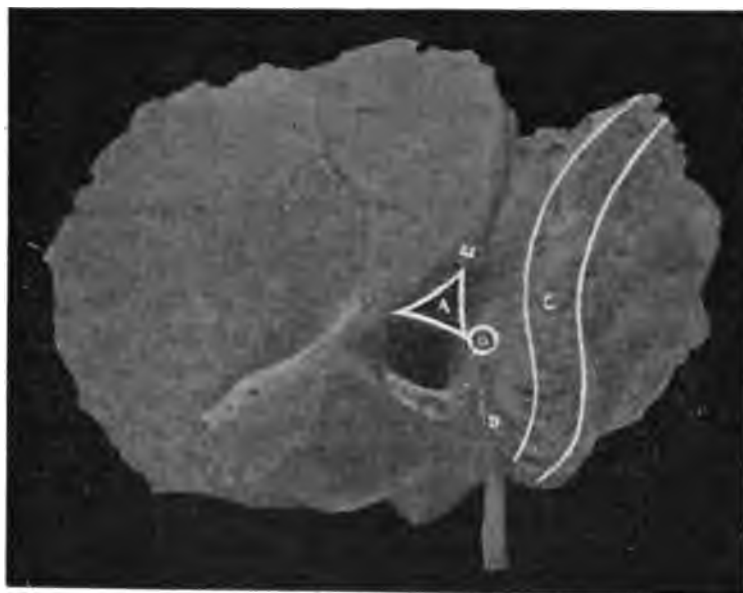
Barr.

A. Supra-meatal triangle —site for opening the antrum.
B. Situation for opening the cortical mastoid cells.
C. Commonest situation of the sigmoid sinus.
D. Line of facial nerve.
E. Posterior root of the zygoma.

chronic mastoiditis, of which I shall have to speak later on.

It is hardly possible, in the time at my disposal to-day, to labour through the rest of the anatomy as I should have liked, but I must speak of the *Eustachian tube,* of which I show you a specimen. Its orifice is in the naso-pharynx, close behind the inferior turbinated bone, below which a catheter may be passed into it through the inferior meatus of the nose. It runs upwards, outwards, and also backwards to enter the tympanum, its inner two-thirds being cartilaginous, and its outer third osseous. It can be opened by different muscles,

produced. Secchi has advanced the idea that owing to this excess of internal pressure the tympanum acts as a pneumatic capsule like Marey's "tambour," and that the ossicles are of no use for conducting sounds. I think he is wrong, because if, as he believes, the tympanum acted simply as a capsule, hearing would be destroyed by perforation in the tympanum, which we know is not the case.

I shall not dilate on the anatomy of the *labyrinth.* The clinical importance of the details is not particularly great, and I will merely remind you that the *auditory nerve* consists chiefly of two parts, a vestibular and a cochlear. The cochlear

nerve goes to the cochlea, and the vestibular nerve goes to the vestibule. The cochlear nerve has mostly to do with hearing, and the vestibular nerve with the maintenance of equilibrium. I show you a diagram illustrating the relation of parts in the internal auditory meatus, where all these nerves find their way into the labyrinth. Above and in front of the internal meatus is the facial nerve, and next to it the pars intermedia of Wrisberg, which has to do with the secretion of saliva. Above and behind is a portion of the vestibular nerve going to the utricle, and the ampullæ of the superior and external semi-

Bonnier.

circular canals. Below and behind enter the branches to the saccule and posterior canal, while below and in front is a spirally arranged set of orifices for the branches of the cochlear division. You see how diffuse and separate the different fibres of the cochlear nerve are. The clinical import of this fact is that whereas in active disease in the cochlea itself the whole of the fibres seem to be more or less affected at the same time, or, at all events, the lower part of the cochlea, there is reason for supposing that in disease in the internal meatus certain fibres of the cochlear nerve before entering the cochlea may be attacked by inflammation or degeneration, leaving the others unaffected. Therefore in the present stage of our knowledge on the subject we think we see an explanation of the fact that sometimes there are gaps in hearing for different parts of the musical scale in disease of the auditory nerve in the trunk internal to the part which is in the labyrinth. In general, it may be said that the fibres of the cochlea have their continuation in tracts passing from the accessory and anterior nuclei, through the corpus trapezoides, the opposite lateral fillet, posterior corpus quadrigeminum, internal corpus

geniculatum, subthalamic tegmentum, and internal capsule leading to the temporo-sphenoidal lobe. The *auditory cortical centre* is situated in the superior temporo-sphenoidal lobe, and it is believed that its posterior portion subserves hearing for low tones, its anterior portion hearing for high ones.

The *vestibular nerve-fibres* end more or less completely in the cerebellum, so that whereas the cochlear nerve has to do with audition, the other is concerned with equilibration. But it has been pointed out that certain fibres of the vestibular nerve may be traced to the parietal lobe, where they come to the cortical region for movements of the limbs, and recent experiments would seem to indicate that there is a *cortical centre for equilibration*, however we may interpret it, on the opposite side of the brain in the parietal lobe.

(Dr. Grant then exhibited diagrams to illustrate the distribution of the *vascular supply*. He explained that he had found that pressure could be applied to the vertebral arteries by exerting it in the sub-occipital regions in the depressions behind and slightly lower than the mastoid processes. These depressions correspond to the triangles formed by the superior and inferior obliques and recti capitis posticus major. The internal ear being supplied by the internal auditory branch of the basilar, which is formed by the junction of the two vertebral arteries, its arterial circulation may be checked or diminished by pressure exercised in the way described.

The lecture concluded with a demonstration of specimens prepared by Mr. Arthur Cheatle, showing the peculiarities in the anatomy of the temporal at various ages, and in different stages of development.)

(Concluded.)

Diabetes Insipidus.—The syphilitic origin of diabetes is discussed in an article by Dr. Victor Bandler ('Archiv f. Dermat. und Syph.,' October, 1897). It is often a delicate question to decide whether the association of the two conditions is accidental, or if the specific disease has a causative effect. A case is related which goes to prove the latter alternative.

Medical Record, January 15th, 1898.

DEMONSTRATION OF SURGICAL CASES AT CHARING CROSS HOSPITAL.

In connection with the Post-Graduate Course, October, 1897,

By HERBERT F. WATERHOUSE, F.R.C.S.,

Senior Assistant Surgeon and Surgeon in charge of the Aural Department at the Hospital.

GENTLEMEN,—I intend to show you some cases which are of more or less surgical interest.

Facial Paralysis from Purulent Otitis Media.

This little girl presents an example of a not very frequent condition,— facial paralysis in association with suppurative disease of the middle ear. She had purulent otitis media following measles, from which she suffered ten weeks ago, since which she has had a fairly profuse discharge of foul-smelling pus from the external auditory meatus. After this discharge had lasted for fourteen days she was suddenly seized with left-sided facial paralysis, and she presents a very typical picture of that condition. Facial paralysis when present in children is frequently caused by suppurative inflammation of the middle ear. It is very rarely caused by non-suppurative inflammation. The paralysis occurs far more frequently in chronic than in acute otorrhœa. In the great majority of cases the condition only comes on after the purulent discharge from the ear has lasted for some weeks or months. The paralysis may be caused in several ways. Of course we may have suppurative inflammation passing from the mucosa of the middle ear to the bone, and causing caries or necrosis of the bony canal, the aqueduct of Fallopius, in which the facial nerve lies; or the destructive and ulcerative process may pass directly by continuity to the nerve, and involve or destroy its conductivity. Comparatively frequently we find that the aqueduct of Fallopius is not an entire bony canal; it has one or more little gaps in it which are covered only by the tympanic mucous membrane. In these cases, of course, no bony trouble need necessarily occur before the paralysis takes place. In the simpler and more favorable cases we have no real

destructive inflammation or ulceration of the facial nerve, but simply a condition of inflammatory effusion into the aqueduct of Fallopius compressing the nerve. These are the cases which usually recover completely; cases of bony disease are those which seldom completely recover. The prognosis of cases of facial paralysis due to purulent otitis media is uncertain, and with regard to them one does wisely to take the patient's friends into one's confidence, and say that at the commencement we do not know what will be the outcome in any individual case, though in the great majority the facial nerve regains its function. In the case of this little girl I do not know really what has been the cause of her trouble; whether there has only been inflammatory effusion into the aqueduct of Fallopius, or whether there is caries or necrosis in the walls of this canal. It is an impossibility to say what cause has given rise to the paralysis. Of course we know it is secondary to the inflammation in the middle ear, but precisely what it is we do not know. Therefore in the prognosis we really must be very guarded. A large number of these cases completely recover, a certain number of them incompletely recover; in some of them, especially those associated with caries or necrosis, the paralysis remains stationary throughout life. A patient was to have come here to-day who suffered from facial paralysis for six months. All of a sudden she felt something move in her ear; she syringed the ear and brought out this sequestrum, which you will recognise as the greater part of the cochlea. That was a case of necrosis, and the pressure of the necrosis had caused the paralysis. In such a case as this, one would suspect that the paralysis would be permanent, but apparently this is not going to be the case with the patient under consideration, for though only three weeks have elapsed since the sequestrum was passed, a certain measure of recovery has already taken place in the paralysis, though of course as a hearing organ the ear is useless.

A word to you about bilateral facial paralysis due to suppurative ear disease. Unilateral paralysis due to ear disease is not infrequent, but bilateral facial paralysis from this cause is very rare indeed; among several thousand children I have only seen one instance of it. But there is a very peculiar form of facial paralysis associated

with deafness which is not at all uncommon, namely, syphilitic. Sometimes patients, usually in the second or third year of their syphilis, will suddenly be seized with facial paralysis, first, perhaps, on one side, then after a short interval on the other side, and this will be associated with either complete loss of hearing or its very serious diminution. If these cases are recognised at once and treated vigorously with antisyphilitic remedies, they almost always recover from the facial paralysis, though deafness usually remains more or less stationary. What the pathology of this condition is nobody knows, because, of course, these cases do not prove fatal, and therefore the opportunities of making a post-mortem examination are practically non-existent.

As regards the treatment of facial paralysis due to ear disease, of course *the* thing is to treat the ear disease. We are treating this little girl before you for the suppurative discharge from the ear, and during the last week or two we have got the ear practically free from pus. I find that infinitely the best of all ear lotions for suppurative lesions is one grain of biniodide of mercury to six ounces of rectified spirit, practically 1 in 3000, and that is what we have used for this patient. You know that the biniodide is a very active antiseptic. The use of the spirit is as follows :—In cases of long-continued suppuration in the middle ear there is often more or less granulation tissue present ; in cases of caries and necrosis there is practically always this granulation tissue, and even if there is not true granulation tissue the mucous membrane is very swollen and œdematous. The action of the alcohol is to dehydrate these granulations, and nothing is more astonishing than the way in which cases of otorrhœa, attended by profuse discharge with granulations, improve after four or five days' application of this remedy, for under its use granulations shrink and shrivel up. I can safely say that since I have given up all watery solutions for this antiseptic alcoholic treatment of otorrhœa, I have shortened the duration of most of my cases by more than half. This is one of the most useful applications that I know of.

Recurring Appendicitis.

The next case I want to refer to is in the Albert Edward Ward, and I think it unwise to move the patient out of the ward at present, but you will have the opportunity of seeing him at the end of the hour. It is an extremely interesting case of appendicitis. The notes of the case are as follows :—The patient is a carpenter æt. 19, who was sent to me by Dr. C. Norman Hamper, of Chislehurst, with the following history. Seven times in six and a half months he had had fairly acute attacks of appendicitis. Most of us have known cases of frequently recurrent or relapsing appendicitis, but I had previously certainly never heard of a case where a man had seven distinct attacks in under seven months, each attack lasting from a fortnight to three weeks each. The history which Dr. Hamper sent with the man was typical ; he had practically every symptom of appendicitis. The attacks would begin with constipation for a day or two, he would then be seized with pain, at first in the region of the navel, then the pain would be localised around "McBurney's point," which corresponds to the base of the appendix (it is midway between the right anterior superior spine of the ilium and the umbilicus). In cases of appendix trouble the point of maximum tenderness on pressure corresponds pretty accurately to the site of the attachment of the appendix to the cæcum ; it is one of the best diagnostic signs of appendicitis. There was in addition muscular rigidity in the right iliac region, there were tumour and increased resistance, rise of temperature, and usually vomiting. The man was treated medically, and after about ten days in the slighter attacks and eighteen in the more severe, he got up apparently well, only to be attacked a week or perhaps a fortnight later with a return of the malady. His case was one of such frequently recurring appendicitis, and his life was thereby made such a burden, that Dr. Hamper advised him to submit to operative treatment. Directly I saw the patient and heard his history I strongly urged the man to have the appendix removed. I a few days later cut down on the appendix, and instead of dividing the muscular fibres of the abdominal wall I separated them, a procedure which is well worth following wherever you can do it, in the abdomen especially. Do not divide the muscle fibres, because if you do there is great risk of ventral hernia. Of course, the external and internal obliques and the transversalis must be separated singly, and this procedure needs a skin incision

perhaps an inch or so longer than the ordinary method of dividing the muscular fibres, but a compensatory advantage is that there is practically no bleeding. In this man of whom I am speaking, I came upon a mass of adhesions as soon as I had opened the peritoneal cavity, and then found that the vermiform appendix was stuck by its distal extremity to the anterior abdominal wall just to the right of the bladder, and that it was therefore anchored at both ends—to the cæcum at one end, and to the abdominal wall near the bladder at the other. What had caused the trouble was a strong adhesion which, passing outwards from just above the middle of the appendix to the right iliac fossa, had kinked the appendix at an extremely acute angle. The terminal part beyond the kink, as you see from the specimen I show you, was distended into an abscess cavity whose interior was ulcerated and contained a fæcal concretion bathed in pus. Without rupturing this abscess cavity the appendix was removed, and the patient saved from what must have meant sooner or later, and rather sooner than later, a perforation with a localised peritoneal suppuration, if not a general septic peritonitis.

It is strange but true that many practitioners hesitate very much now-a-days to recommend patients to submit to removal of the appendix. In my experience it is an exceedingly safe operation. The only real trouble is that sometimes the appendix cannot be found. This has happened to me once : I cut down on a mass of dense cicatricial adhesions, and after trying for an hour to find the appendix I had to give up my search. Fortunately the patient has not had an attack since. In such a case one has no option but to close the abdomen and await events. But in the great majority of cases you can very readily remove the appendix, and in almost all these cases there is some obstruction to the calibre of the appendix, and the distal portion has distended into a sac containing either mucus, muco-pus, or pus, and very often a fæcal concretion. It is an operation which I think is almost void of danger, and it is finally curative. I think one can honestly say that there is less risk in careful hands in removing the appendix, than there is in one more attack of appendicitis. Of course, I do not say operate on every case of recurrent appendicitis, but I do say in cases where attacks are becoming

more frequent, it is wise to remove the appendix. If they are becoming less frequent there is justification for waiting. It is obvious that in a case like the one I have just related no treatment short of operation could have been of any avail as the appendix was fixed at its distal extremity, and was kinked at an acute angle by a very strong adhesion to the iliac fossa, and its terminal end was distended into an abscess cavity. Another attack or two of appendicitis in this patient must have caused perforation, and that would have exceedingly endangered his life. Now, after the operation, things are perfectly satisfactory. The operation was performed four weeks ago, and in another week the patient will leave the hospital permanently cured.

Gummatous Periostitis of Clavicle.

The next case I show you is one in which I have been more in doubt about the diagnosis than in any I have seen for some months. The man is an attendant at an asylum, and has been under the observation of Dr. Bond. You will hear the man relate his own history. Six or seven months ago he noticed a painless swelling on the collar-bone. He three or four months later showed it to Dr. Bond, who sent him up to me. If you examine him you will find an ovoid swelling occupying the middle third of the clavicle. This swelling, which is about the size of a hen's egg, feels bony almost all over except that there is one rather softish spot in front where you may almost imagine you get fluctuation, and where egg-shell crackling may be felt. He can move his arm without much pain ; but he has recently had some pain at the back of his neck. The tumour is not large enough to press on the subclavian artery, and there is no alteration in the two radial pulses. The only two possible diagnoses are, I think, sarcoma or gummatous periostitis. The man has been perfectly candid, and tells us that he had a soft chancre when he was in the army, for which he was only treated for seventeen days. Apparently he had no definite symptom of syphilis ; the chancre was painful, he tells us, but he had no spots elsewhere on his body, and no sore throat. No mercury was given him for this chancre. Several of my colleagues have been good enough to see the case, but they have found it very difficult to give any definite opinion. If it be a sarcoma, I think there is little

doubt that it is a central sarcoma which is growing from the interior of the bone, and it is almost certainly myeloid on account of its slow growth. It was noticed six months ago, and probably had been in existence before that time. The thing to do in cases of doubt is to put the patient on very large doses of iodide. He is now taking two drachms of iodide of potassium in twenty-four hours, and he is having mercury in addition. I do not, however, think there has been any change whatever, though the man now says he thinks the lump has moved towards the shoulder. If that statement be correct, it points almost conclusively to gummatous periostitis or subperiosteal gumma. But, of course, such an impression must always be received with caution, for patients often fancy lesions shift in position. If the tumour be sarcomatous the proper course is to remove the clavicle, an operation not lightly to be undertaken. I think it is wise to press the iodide still further, and I shall therefore do so. I have still an open mind on the subject, though certainly one would have thought that the iodide had had time to have caused some diminution in size had the case been one of a syphilitic nature.

Further Note (October 24th).—Two days later, on examining the patient again, he complained that he had lost testicular sensation in the right testis. On examination it was at once seen that the right testis presented a typical example of syphilitic interstitial orchitis. On the iodide being continued this testis has markedly diminished in size, and testicular sensation is returning. The clavicular swelling is very little smaller than before treatment was commenced. The case is interesting as showing the resistance of the clavicular periosteal swelling to vigorous anti-syphilitic treatment.

Enormous Cyst of Thyroglossal Duct.

The next case is one which has been operated upon. It is one of cyst of the thyroglossal duct. Such cases are not so rare as some are apt to imagine, but they are almost always called by some other name. This patient was sent to me by Dr. St. Leger, of Watford. He had an enormous cystic tumour which contained two pints of a greenish opaque fluid of the consistence of thick treacle. This large tumour did not lie mesially, but markedly to the right side of the middle line. The man says he has had a swelling for more than thirty

years, and that it had been latterly growing much more rapidly. I wished to enucleate it, but there was not room to take it out wholly between the lower jaw and the clavicle; I therefore had to incise it and let out the contents, after which I removed with comparative ease the fairly thick cyst wall. Owing to the time it had been in existence there had been some inflammation of the tissues surrounding the cyst, so it was in some places firmly adherent to the skin and the deeper structures. Below it was fused with the isthmus of the thyroid body, while above it was fixed firmly to the hyoid bone, and separated the two halves of the tongue; that is to say, it projected upwards on to the dorsum of the tongue almost as far as the foramen cæcum. When I had enucleated the cyst the patient's tongue was almost in two halves, with little more than the mucous membrane joining them above. I do not want in this demonstration to enter upon an embryological discussion, but I may remind you that there is in fœtal life a tube known as the thyroglossal duct which leads from the foramen cæcum in the tongue to the front of the trachea, and that its lowest part forms the isthmus of the thyroid body, but not, as is commonly taught, the whole of the gland. The remaining part of the duct becomes entirely obliterated, except that its mouth persists as the foramen cæcum, and there is not even left a fibrous cord to mark the original situation of the duct. Thyroglossal duct cysts are rare; but patency of the duct, allowing a probe to be passed some two inches or so downwards from the foramen cæcum, is even more rare. Of this condition I have only seen one example.

The manner in which a cyst forms in the duct is that owing to some cause a segment of the duct fails to undergo obliteration. The duct is obliterated above and below this segment, in the interior of which the dermoid contents are secreted by the action of the epithelial cells which line this segment of the duct. Soon the segment becomes distended, and a little globular cyst is formed. The odd circumstance is that these cysts seldom manifest themselves before puberty, but usually do so soon after this period, attention being directed to them most frequently between the ages of sixteen and twenty-four years. The thyroglossal duct is formed before the hyoid bone, and the developing hyoid bone divides this duct into two, the upper half being

known as the lingual duct, the lower segment as the thyroid duct. Cysts arising in connection with the thyroid duct are therefore called sometimes accessory thyroids ; and similarly those springing from the lingual duct, lingual dermoids. I have operated on six or seven of these cysts, but the present case is the only one in which the tumour was really of large size, and where the whole thyroglossal duct was involved. The interesting points of this case are that the cyst was firmly adherent to the hyoid bone, and that owing to its great size the originally mesial cyst had by its own weight been drawn over to the right, the patient inclining his head to this side. Lingual dermoids project but little into the floor of the mouth. A diagnostic point between a ranula and a lingual dermoid cyst is that the former cannot be felt below the jaw, between the hyoid bone and the chin, whereas a lingual dermoid projects into the region between the chin and the hyoid bone more than into the floor of the mouth.

Chronic Periostitis of Ramus of Jaw, due probably to a small Necrosis.

This youth has a large firm mass involving the ramus and the angle of the jaw. The tumour is firm, painless, and has decreased somewhat in size for the last three months. He came to my outpatient room four months ago, when he had no rise of temperature, and the tumour was painless. The general opinion expressed was that the mass was a sarcoma, and if it had not been for one fact I should have been led to think it was of that nature myself. But on close questioning we found that eight months ago a doctor stuck a needle into it, and got a drop or two of pus from it. It is a good clinical fact to bear in mind, that sarcoma and pus almost never occur together. As I have only once seen sarcoma associated with suppuration, I make it a clinical rule to say a tumour is not sarcomatous if there is pus in connection with it, and this is a rule which has saved me from error on several occasions. In this case there is almost certainly some small necrosis of the jaw, around which there is probably a very considerable periosteal thickening, which has led to the development of some new bone. It is, in fact, chiefly a chronic periostitis. It is being treated with iodide of potassium, not because there is any suggestion of syphilis in the case, but because the

drug does good to periosteal swellings other than syphilitic. The mass is now slowly subsiding. You may say, why does not one cut down upon it ? But between the skin surface and the bone there is the parotid gland and the facial nerve, not to mention other structures, and I might incise the patient's face very freely, and not find any necrosis after all. I have learnt by rather painful experience that it is much better in these cases, wherever the condition is fairly quiescent, to leave nature to cast off the necrosis than to make an extensive dissection in the attempt to remove it.. Nature will leave a very much smaller mark than the surgeon, and nature will not cast off the sequestrum until it is ready to go.

A Case of Precocious Syphilis.

The patient who is now before you is interesting because he presents an example of what one may call precocious syphilis—that is to say, an example of syphilis in which certain symptoms appear much earlier than one expects to see them in the course of this disease. He had syphilis twenty-three months ago, and I treated him for the chancre and secondaries. Twelve months after the appearance of the chancre he came to me with two distinct gummata, one in the subcutaneous tissue over the shoulder, the other over the tubercle of the tibia ; now he presents himself with unmistakable leucoplakia linguæ. Such cases are not very rare. When one first comes across a case of precocious syphilis one is inclined to take it for granted that the patient has made a mistake in regard to the dates of his lesions. As one does not expect to see gummata under twenty-four months or more from the date of the initial lesion, medical men are very prone to come to that conclusion, but I have had now three or four cases similar to the present one about which I have absolutely no doubt, as I have treated them throughout the whole course of the disease. Leucoplakia is looked upon as a tertiary symptom, and this man has it in a marked degree twenty-three months after his primary chancre. Many bad cases of syphilis seem to run a very rapid course, and commence their tertiary symptoms very early. You know that the line of demarcation between secondary and tertiary symptoms is extremely ill defined, and syphilis answers very badly to the text-book descriptions as regards time. In my

limited experience cases where the so-called tertiary symptoms come on very early are those in which the secondary symptoms have been very slight. As regards the treatment of leucoplakia linguæ, the main point is the avoidance of all irritation. Thus smoking, spirit drinking, condiments, and all irritant applications must be strictly forbidden.

Case of Phantom Tumour in an Unusual Position.

The next patient is a girl æt. 22, and she presents an example of phantom tumour, and in a very unusual position. It is a phantom tumour of the infraspinatus muscle. When I first saw her ten days ago in the out-patient room the general opinion then expressed by those who examined her was that she had a neoplasm, probably a sarcoma, occupying her infrascapular fossa, where a hard, firm, tensely elastic tumour was distinctly felt. On questioning her we found that four years ago she dislocated her shoulder, and I think there is not much doubt that some reflex irritation, the result of this injury, has led to the contraction of the infraspinatus muscle. I examined the girl under anæsthesia, and found that the tumour at once vanished, to reappear immediately consciousness was restored. You see the girl now, and can feel the firm mass in her infrascapular fossa. I have found that when the arm is suddenly rotated outward the tumour disappears. You will observe that sudden outward rotation of the arm has caused disappearance of the tumour.

Injury to Median Nerve just above Wrist.

The next case illustrates paralysis of the median nerve from injury just above the wrist. It is not an infrequent condition. This young man cut his arm with glass eighteen months ago, and as a result has almost total paralysis of the median nerve below the point of injury. He has marked atrophy in the muscles of the ball of the thumb, and cannot abduct this digit. He has almost complete anæsthesia of the parts supplied by the median nerve. If we turn to the dorsum of the hand we notice a point in anatomy which is not generally recognised, viz. not only does the median nerve supply the outer three and a half digits on their palmar aspects, but it also is the sensory nerve of the integument covering the second and third phalanges of the index, middle, and ring fingers on their dorsal aspects. He has,

as you see, almost complete anæsthesia over these last two phalanges on the back of the hand, and this condition is always to be found in median nerve paralysis. There is no reaction in the muscles. I am anxious to know whether the median nerve is only partially cut through, accounting for there being some little sensation in the thumb and palm, or is strangled by cicatricial fibrous tissue. In the case I now show you, I dissected the right median nerve some months ago out of a dense mass of fibrous tissue; the nerve was not divided in any way, but was surrounded by a dense cicatricial mass, and had been completely functionless for four months. When the constricting cicatricial tissue was removed the function of the nerve was in large measure, though by no means completely, restored. The young man I first brought before you is a barman, but he wants to be an engineer. I am afraid, however, that even if the operation is as successful as we could expect it to be after eighteen months' paralysis, he will find himself unable to execute some of the finer movements which an engineer requires to perform.

Gumma simulating Acute Abscess.

This next patient presents a common condition, but one which I thought worth showing to you because there might be some little doubt about it. There is a swelling on the front of the sternum which presents very distinct fluctuation; the skin is red and tense, there is a central softening and a surrounding induration. This swelling is somewhat painful. At first it might readily be mistaken for an acute abscess, and was generally thought to require incision when he attended my out-patient clinique yesterday. On questioning him, however, he admits to having had syphilis four or five years ago, and on examining him there is seen a deep gummatous ulcer over the left shoulder, with undermined edges, hard and infiltrated. Our diagnosis, therefore, is that of gumma breaking down in the centre, and we decide to treat the patient with large doses of iodide of potassium. Many times is the surgeon called to open an abscess which proves to be a gumma capable of complete absorption under iodide of potassium. In such cases as the present one the similarity to abscess is very close. The mistake is one which can in most cases be avoided by careful inquiry into the history of the case.

NOTE ON THE USE OF CAFFEINE IN HEART DISEASE.

BY

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ON reading text-books of medicine and therapeutics we find it stated that " caffeine is useful in cases of cardiac dropsy ; " but such statements fail to make much impression unless accompanied by illustrations of the results obtained in actual practice.

For the treatment of the same condition everyone knows that digitalis is the most important drug; but, nevertheless, it does sometimes completely fail to afford any relief; and it is particularly in these cases that caffeine may be of valuable service.

It is to be borne in mind that digitalis may fail to act where there is great portal congestion unless mercury and hydragogue purgatives are also employed ; but in the following case these measures were not neglected, and yet digitalis had no effect.

It is usually taught that in cases of aortic regurgitation when the symptoms of mitral regurgitation supervene with dropsy and enlarged liver, digitalis may be given with the same degree of confidence as in pure mitral regurgitation ; but the case presently to be described tends to show that exceptions occur to this rule, and that under these circumstances caffeine is of far greater utility than digitalis or strophanthus.

In this case hypodermic injections were employed first in order to obtain the most rapid action of the drug. The solution used for this purpose was made up according to the recommendation of Martindale and Westcott, with the proportion of 20 grains of caffeine to 17½ grains of salicylate of sodium.

The patient, a stout man æt. 55, was admitted to the hospital on July 22nd under the care of Dr. Acland, and it is through his kindness that I am enabled to relate the case.

The previous history showed that the patient had suffered from " rheumatics " for many years, but had never been laid up with it, and he also had had frequent attacks of tonsillitis in his younger days. On admission there was orthopnœa, with great restlessness and insomnia, considerable œdema of the legs and lumbar region, and constant severe pain about the liver.

On examination it was found that the heart was greatly enlarged, and the impulse strongly marked, the apex beat being in the seventh space in the anterior axillary line. There were signs also of dilatation of the aorta. At the apex was a loud and long systolic murmur replacing the first sound, and heard at the back. A soft systolic murmur was present in the aortic area, and subsequently a diastolic murmur was detected. Liver greatly enlarged, and extending down to within two inches of the umbilicus. Pulse 90 per minute, of " waterhammer " character. Râles were present at the posterior bases of the lungs. Urine sp. gr. 1024 ; cloud of albumen.

Treatment.—Ten minims of tincture of digitalis, five minims of tincture of nux vomica, in mixture with spirits of chloroform and water, every six hours ; mercurial pills and sulphate of magnesia to maintain free action of the bowels ; sulphonal or chloralamide to be given at night ; six leeches to be applied over the liver.

The pain in the liver was slightly relieved, but otherwise there was no perceptible improvement from this treatment. On August 13th, therefore, the digitalis was discontinued, and ten minims of tincture of strophanthus substituted in the mixture.

On August 20th the condition of the patient was worse in every way, and the scrotum was swollen with œdema to the size of a small cocoanut. The urine gave a heavy deposit of albumen on boiling. The quantity of urine passed on this day was only sixteen ounces. On this date hypodermic injections of three grains of caffeine dissolved in salicylate of sodium and water to eight minims were commenced, being given twice daily in the arms.

August 26th.—Decided improvement in general condition ; breathing is much easier, and the pain in hepatic region has almost gone. The injections in the arms cause considerable local inflammation. Injections are now given in the skin of the back between the scapulæ, and do not produce any pain or signs of inflammation. The œdema is subsiding. Patient sleeps well now without chloralamide.

27th.—Injections stopped, and the following mixture given by the mouth :

Caffeinæ	... ...	gr. v.
Sod. salicyl. ...	... ...	gr. iv.
Aq. ad	... ...	℥j.

Bis die.

September 3rd.—Rapid improvement. Breath-

ing is now quite easy, and the œdema has completely disappeared.

A few weeks later there was a troublesome attack of tonsillitis, and also rheumatism of the foot and knee, but no marked rise of temperature. When the patient was discharged on October 21st, he could walk about without any dyspnœa, and he affirmed that he was feeling better than he had done for years. There was practically no change in the cardiac and liver dulness, but the quantity of albumen in the urine was much diminished—a light cloud only appeared.

The main point that concerns us here is the rapid improvement in the general condition of the patient, coincident with the establishment of diuresis effected by caffeine. The quantity of urine passed every day was carefully measured, and the result was as follows :

Average quantity passed per diem from July 24th to Aug. 14th, under digitalis, 28 ounces.

From August 14th to August 21st, under strophanthus, 18 ounces.

From August 21st to August 28th, under hypodermic injections of caffeine gr. iij twice daily, 30 ounces.

From Aug. 28th to Sept. 3rd, under caffeine by the mouth, gr. 5 twice a day, 120 ounces.

From September 3rd to September 10th, under the same treatment, 67 ounces.

The smallest quantity passed in one day was 14 ounces on August 6th, the largest 161 ounces on August 31st. It is observed that the quantity of urine began to increase from the time of the first injection. For the first three days the rise was slight though progressive, it then increased more rapidly, and by the end of the week diuresis was thoroughly established, so that the injections could be dispensed with and the drug given by the mouth.

Comparing, then, the action of the three drugs in this particular case, we see that digitalis was without effect, strophanthus was even deleterious, but caffeine was remarkably successful.

Mitral stenosis is another form of heart disease in which digitalis is often given without any good effect, and in advanced cases with much œdema. I should feel disposed to try the same line of treatment with regard to caffeine, but would scarcely expect to see such prompt and satisfactory 'on as in the case related above.

MEETING OF THE SOCIETY OF ANÆSTHETISTS,

At 20 Hanover Square, December 16th, 1897.

The President, Dr. DUDLEY BUXTON,

in the Chair.

(*Concluded from p.* 231.)

DR. FLUX made a communication on a case of protracted anæsthesia following the administration of nitrous oxide gas. The case that he referred to in this communication was, so far as his personal experience went, unusual. It was an inconvenient kind of case to occur, and he proceeded to relate the circumstances of the occurrence. A girl of 19 years of age, well nourished and not anæmic, was seen by him at the National Dental Hospital. The girl was in good health except for a slight toothache. The case was one requiring extraction of two bicuspid teeth ; pure gas was administered, and the administration was not pressed beyond irregular breathing. Both teeth were removed, but the patient did not come to. Her recovery was delayed for one hour and twenty minutes, at the end of which time the recovery was abrupt and complete. After the extraction of the teeth, in the place of abrupt recovery, the patient was in a state of deep and calm anæsthesia. She was lying back in the chair with her eyes open, all the limbs flaccid, the pulse beating evenly, and after waiting a minute or two attempts were made to rouse her by slapping and pinching, but these simple measures produced no effect. Nitrite of amyl in a capsule was exhibited, but it merely produced a transient blush, and as there was no cardiac or respiratory failure she was placed on the sofa for twenty minutes. No change having occurred, the brush of the faradic current was applied to the arm, the face, the neck, and the legs, but no sign of discomfort was elicited. Ammonia and ether vapour applied to the nostrils were ineffectual. A further period of thirty minutes' rest was then given, and the current again applied, with the effect of slightly drawing up the lower limbs. Otherwise no change occurred, but about ten minutes later the pupils suddenly contracted, and she recovered as if nothing had occurred, She walked away from the hospital in good spirits,

and with the avowed intention of going home and getting some food. As far as could be ascertained she was in the enjoyment of good health, and was not emotional. A succession, however, of disturbing events had happened just recently; she had had no sleep for three nights, and her appetite had been poor; she had also fainted in the anteroom while waiting for the gas, a fact of which the administrator had not been informed.

Mr. TYRRELL said that in the last sentence there was a clue to the case, and that was that she fainted in the anteroom. The functional nervous derangement of what is called "losing themselves" is so very commonly termed fainting, that unless the patient was seen in a syncopal condition by a medical man, one would regard that fainting as hysteria, which he fancied must be the only explanation. He had never heard anything like the case before.

Mr. CARTER BRAINE said that this case reminded him of one of not exactly the same nature, but yet one which bore out Mr. Tyrrell's opinion. He was once about to administer gas to a lady, and when he had just adjusted the face-piece he noticed that she had become unconscious—there was something peculiar about her look which made him think that she was unconscious. He tested the conjunctival reflex and found it absent, and the pupil dilated. The dentist actually removed two teeth, and the patient never winced at all; she never felt any pain, and remained in that condition for two to three minutes, and then she came round. She was subject to hysteria and epilepsy and given to fainting, and he (Mr. Carter Braine) attributed the whole circumstance entirely to hystero-epilepsy, and was more than astonished to see her become unconscious prior to the administration of the anæsthetic.

Mr. TYRRELL said that when he was at the Dental Hospital in 1871 he saw Mr. Woodhouse Braine commence to give gas to a girl, and after the face-piece had been on for two minutes, with the stopcock for the gas not turned on, the patient became unconscious, and two teeth were removed. She was brought up again in the following week, and she had two more teeth out, becoming again unconscious after breathing air with a face-piece applied and no gas turned on.

Dr. PROBYN WILLIAMS asked concerning the state of the pupil in Dr. Flux's case after the gas

had been given; did the pupils remain dilated all the time? Had Dr. Flux tested the conjunctival reflex, and was inquiry made into the nervous history of the patient?

Dr. SILK said that he should hesitate to put these matters down purely to hysteria. Hysteria was a wide term, and he was not quite certain as to what was meant by it. He was quite sure that in the gas extraction room of any dental hospital there was probably a more concentrated essence of hysteria than in any other place of the same size. If the case referred to to-night was due solely to hysteria, it was remarkable that we did not see and hear of more of them. He should be much inclined to accept Mr. Carter Brain's view that there was some element of epilepsy in the case, and he thought that the term hysteria would hardly explain all the facts.

Mr. EDWIN WHITE said that this patient was in a strained position when she became unconscious, and it might be explained by hypnotic effect.

Mr. HILLIARD said that an experience of his led him to look upon Dr. Flux's case as one of hypnotism, in a patient unduly susceptible to hypnotic suggestion. He had been making experiments in hypnotism with a friend upon one of "Professor" Fricker's subjects, among others. This subject he had himself hypnotised on several occasions, and once the man came up suffering from alveolar abscess from a carious tooth. Mr. Hilliard determined to try the effect of hypnotic suggestion on this patient, and told him he would give him gas, and that his friend would operate on his abscess; accordingly he applied his gas apparatus, which had previously been filled with air instead of gas, and suggested to the man that he would fall asleep after breathing through the inhaler several times. As he had expected, the man quickly became unconscious; his abscess was opened and treated and the tooth extracted without the patient evincing the slightest sign of pain. This case was clearly one of anæsthesia produced by hypnotic suggestion.

In reply to a question by Dr. PROBYN WILLIAMS, Mr. HILLIARD said the man was awakened by using the ordinary methods for rousing patients from hypnotic sleep.

Mr. E. A. STARLING said he was giving a small quantity of ether, preceded by nitrous oxide, a short

time ago to a young woman of twenty-three or twenty-four for the extraction of teeth. The teeth were duly extracted, but afterwards the patient did not become conscious as quickly as usual after such an operation. Her colour and her pulse were good, but her breathing was shallow though regular, and almost entirely abdominal; the pupils were dilated, and conjunctivæ insensitive. She was laid on a couch and kept under observation. Ammonia and stimulants did not do any good. Artificial respiration was tried, but with the result that she only became very slightly conscious after a time. The most efficacious restorative in her case was rhythmical traction on the tongue. This was adopted after the condition had lasted an hour, and it restored her in a few minutes. The case was diagnosed as one of hystero-epilepsy, and no anxiety was felt in consequence. On questioning the girl's mother a little later it was found that she was subject to fits of hystero-epilepsy. Her medical attendant had suggested that her mouth had better be seen to, and be cleared of bad stumps to avoid one source of the epileptic trouble.

· Dr. FLUX, in replying, said that in reference to the question of the condition of the eyes the conjunctival reflex was absolutely gone, and for more than an hour there was no response whatever to the irritation of the conjunctiva. From the very beginning the pupils were dilated, and remained dilated until the comparatively sudden recovery at the end of one hour and twenty minutes; her pupils were absolutely dilated for more than an hour and twenty minutes, and when she did recover she recovered in the ordinary way that gas patients did. The patient fainted in the anteroom, and was carried out into the air to recover. As far as he could find from the patient's friends she never had had any fits, and enjoyed good health. She was quite rational when she came round.

The meeting concluded with a vote of thanks to the contributors of papers.

Acetonuria (Felix Hirschfeld).—In healthy persons a diet of proteid and fat leads to an increase of acetone in the urine. The addition of carbohydrate to the diet causes this to disappear. This is explained by its "sparing" action on proteid metabolism. The same holds in the acetonuria of disease, and explains the occurrence of acetone in diabetics, in whom carbohydrate metabolism is upset.

Centr. Klin. Med., 17; *J. Chem. Soc.*, 1897.

PRACTICAL METHOD OF REMOVING A PLASTER-OF-PARIS DRESSING.

By J. TORRANCE RUGH, M.D.

To the general practitioner or to any one who has but little to do with plaster-of-Paris dressings, and consequently has none of the more improved instruments for cutting them, the question of *how* to remove them becomes of almost as great importance as *when* to remove them. With the hope that a few readers may be benefited by a short review of the subject, I shall mention some of the methods more frequently employed and more practical.

The statement might be made that any one can take off a plaster bandage and it would not be amiss, but in so doing, many may do untold injury to the part or parts involved, and entirely undo all that has been accomplished by the rigid dressing, and besides cause the patient much unnecessary pain and discomfort. As in all other things, there are proper and improper ways of removing these bandages, and he who can properly cut and take off one will frequently find his knowledge of inestimable value to himself as well as to his patient.

Before attempting removal, two questions must be answered as affecting the manner of cutting the splint: Is the splint to be reapplied? or is it no longer useful, and hence to be thrown away? If to be replaced, much more care must be observed in cutting it than if it is to be discarded, for, when reapplied, it must fit as accurately and closely as before removal, and its rigid character must be preserved, else its efficiency is much interfered with. There must also be no rough and uneven edges to irritate or pinch the skin after the firm retaining and fixing bandage or cloth has been applied.

Having decided as to the final disposition of the plaster dressing, one marks with a pencil the direction in which the cut is to be made. If the dressing is about the waist and is to be thrown away, the best line for cutting is along the side; but if to be reapplied, then along the front or on the nipple line. If on the leg or arm, the front cut is the better for either purpose, as in the

former case the lateral diameter of the foot is much less than the antero-posterior, and consequently the bandage must be separated much less in order to remove it. For cutting neatly and safely through a plaster bandage, there is nothing better than a small saw curved on the cutting edge. The preferable forms are known as the Hunter or Sherman saws, of which the blade is about five inches long, and one and a half broad, and with the teeth so placed as to cut by drawing the blade toward the operator. The teeth should be of medium size, as, when fine, they clog too easily, and, when coarse, they do not cut the cotton mesh of the dressing readily and the saw is very hard to start. Also a saw should be short and the curve at the point should be quite sharp, so that in cutting over a hollow part, as in front of the ankle, the plaster can be cut through evenly at all points, and in such a position a rocking motion of the saw will cut most rapidly and satisfactorily. The toothed edge should extend from the handle to the point of the blade, giving as long a cutting edge as possible, so that where the bandage is on a flat surface the cutting can be done more rapidly; then, too, if the cutting edge is long, the blade must be broader to give the necessary support and strength, hence it will be more rigid, which is a quality of efficiency.

In using the saw, long strokes should be employed until about through the plaster, then short ones until finished, as the splint is seldom of a uniform thickness, and if it is being cut rapidly, the saw may slip suddenly through the remaining layer of plaster and the protective, and scratch or cut the skin.

Various patterns of rotary saws have been used, but have not proved satisfactory, especially with a bandage of any thickness. An ordinary hand-saw may very well be used in those cases in which the surface of the part to which the plaster is applied is quite flat or even; sometimes also the cutting can be begun with this and finished with a pair of short-bladed scissors or a knife.

Next to the saw, probably the most frequently employed instrument is a heavy scissors, but, as a rule, it is unsatisfactory. Many different forms have been devised so as to combine leverage with cutting power, and all but one have been discarded as useless except in quite thin and soft dressings. The one, however, known as Reed's plaster-of-Paris cutter, is really very serviceable, and will cut plaster of any thickness that can be crowded between its blades, and of any degree of hardness. It has one broad, solid blade, almost U-shaped, having the handle attached at the top, and having the cutting edge below with several saw-teeth at the anterior end of this edge. The cutting edge is curved from behind forward, and fits closely to the other blade, which is somewhat L-shaped. The upright of this blade, which springs from the handle, is broad and flat, giving great strength, and the horizontal portion tapers to a probe point, and has the cutting edge slightly concave. When the broad blade passes the other, there is a double motion, direct crossing and sliding of the edges on one another, which enables the blades to cut through the densest plaster. To cut with them the narrow blade is inserted under the plaster, the handles are brought together, and the whole instrument is then tilted upward and forward; the teeth catch in the plaster and the lower or narrow blade is drawn upward through the cut just made, and this cut so enlarged that the blade can again be pushed forward and the process repeated. The leverage is powerful because of the short cutting edge and the manner of uniting the two blades, the rivet being placed well forward and above the cutting edge, which last is about two inches below the line of the handles.

If the plaster is thin or has been softened by some means to be mentioned later, a strong pair of scissors with short blades will ofttimes suffice for removal. Probably one of the most generally serviceable instruments, however, for regular use, or in emergencies, is a strong sharp knife with a hard temper, which when used to cut obliquely is most efficient. A short time ago I went to the country to operate upon a tuberculous knee, and found a heavy plaster-of-Paris dressing on the entire leg. I had, of course, forgotten the plaster saw, but the family had a shoe-knife, which, fortunately, beside being strong and hard, was sharp, and with it I very quickly and easily removed the dressing, cutting obliquely and drawing the upper part away as it was cut through. When done in this manner, there is no danger of injury to the patient, as the part to be cut is constantly exposed. Of course, this breaks and destroys the dressing, rendering it unfit for further use. If it is to be reapplied, a solvent such as dilute nitric

or acetic acid, or strong potash, or ammonia, may be run in a line down the splint with a dropper, and it can then be readily cut with an ordinary knife. Strong vinegar will answer if the stronger chemicals are not at hand, and usually proves very satisfactory.

A mallet and chisel have been used to cut off a plaster bandage, but their use must necessarily be accompanied by more or less jarring, and, in many cases, pain to the patient; hence they are not to be recommended where much more satisfactory means are at hand. One other method remains to be mentioned in this class. When the bandage is being put on, a stout string is put underneath in the line along which the opening is to be made. When ready to be removed, a strong wire which has been nicked at several places, is attached to the string and drawn through under the plaster. The wire is then sawed back and forth, and the plaster cut through as by a chain-saw. When a plaster dressing is being applied, various devices may be incorporated which will favour removal. One of these is to place stout but thin steel wires between each layer of bandage, one over the other, leaving the ends out. When ready to remove the splint, one pulls up each wire separately, beginning with the top one, and the plaster will be torn through. Another method ofttimes employed, is to place a Λ-shaped piece of zinc or tin upon the lint or cotton protective, and apply the plaster over this. When ready to cut the splint a rasp or coarse file is used over the ridge made by the tin or zinc, and the desired end is soon accomplished.

By using a solvent as above indicated, a plaster dressing can be cut by almost any instrument, and what at first may appear to be a very difficult matter, finally becomes quite easy.

Finally, the bandage may be cut through directly after it has been applied, and before it is quite hard. A strip of tin (metal) or lead is first laid upon the part and the plaster applied over this. Then, before the hardening process is complete, the dressing is cut by a knife over the metal strip, after which the strip is drawn out. There is thus no danger of cutting the patient, and the cast can be removed whenever occasion demands, by simply cutting the protective with scissors and spreading the splint. By doing this carefully, the exposed part can be thoroughly examined, and if necessary lifted out of the cast and again replaced. In case

the plaster is reapplied, it must be bandaged firmly or held by strips of adhesive plaster after it has become thoroughly dried. This is a most satisfactory method in cases in which there will be but little strain upon the cast after it has set, but the dressing is not so rigid and stable as when uncut. If the cut edges of a plaster are rough, or it is to be worn for a long time, they should be bound with adhesive plaster or with some similar material or with fresh plaster-of-Paris bandage. When the skin is properly protected by lint, cotton, or such, there is little or no danger of cutting it with the saw, as the sensation of cutting plaster is so different from that of cutting cloth that one readily recognises the fact that the saw is through the bandage. But if the part is unprotected, and this should but rarely occur, removal without cutting or scratching the skin is almost impossible even by the most careful and expert operator. In these cases, the risk of cutting the skin may be overcome by passing a case knife or spatula, or a strip of tin or zinc underneath the plaster, and cutting upon that.

NOTES.

The Treatment of Perityphlitis in Childhood. — Karewsky ('Berlin klin. Wochenschr.,' 1897, xxxiv, No. 7, 150; No. 8, 169). The therapeutics of this disease are still not clearly defined. The mortality of children operated on varies between 25 per cent. and 66 per cent. Sonnenburg, however, reports a mortality of only 8 per cent., the same as in adults. When we discriminate between the circumscribed and the diffuse cases, Rotter has obtained a mortality in the first of 2·5 per cent., in the latter of 66 per cent.; Sonnenburg 0·0 per cent. and 43 per cent.; Karewsky 48 per cent. and 55 per cent. The initiatory complaints in perityphlitis not infrequently are dyspeptic symptoms, and here an early resort to intestinal irrigations or cathartics is often fatal.

An operation should be performed even in those cases in which the prognosis is grave, for even these cannot be said to be absolutely fatal. Karewsky emphatically protests against the re

moval of the omentum, as advocated by Baginsky, for the reason that this is unnecessary as well as dangerous ; the vermiform appendix also should not be removed if it has to be searched for amongst adherent intestinal coils.

Puncture of the abscess, for diagnostic or therapeutic purposes, should not be made, on account of the danger of perforating the intestines ; on the other hand, an exploration *per rectum* often facilitates the diagnosis.

Karewsky rather favours operating once unnecessarily than once missing an operation where it is needed, because the danger of a missed operation as against an unnecessary operation is exceedingly great. He believes, however, that in the presence of a diffuse peritonitis we should delay as much as possible before operating.

Renvers has observed 134 cases of perityphlitis in three years, of which three out of eighty-seven cases in which no operation was done, died, and ten out of forty-seven cases which were operated upon. Among the latter were five greatly complicated cases. In sixteen cases there had been over three relapses. In the presence of a peritoneal irritation, operative measures should not be undertaken. Baginsky has observed twenty-six cases of perityphlitis in 2900 sick children at the Kaiser Friedrich Kinderkrankenhause, of which nineteen recovered without operation, two died without and four following an operation. Baginsky has observed cases which recovered spontaneously, where an operation seemed fatal. He believes, however, that an operation is indicated as soon as circumscribed dulness, pain, fever, and formation of abscess are present. Furbinger has observed 389 cases of perityphlitis in ten years, among which fifty-four were children. Of these two died with peritonitis ; six were operated upon and recovered, no relapses occurring. He is not in favour of indiscriminate operation in perityphlitis. In certain cases puncture for diagnostic purposes may be very valuable, and if carefully performed, without any danger.

Sonnenburg has observed perityphlitis in thirty-seven children, of whom six died ; seventeen were operated on in the first attack, which in these cases was accompanied by grave symptoms. Sonnenburg emphasises that the passing of the attack in perityphlitis is by no means equivalent to a cure. Sonnenburg's mortality in this disease was 18—19

per cent., all of which were complicated cases. As soon as suppuration is present we must not look for a spontaneous cure ; an operation alone can lead to a definite cure. The gangrenous form, which is of relatively frequent occurrence in childhood, and difficult to diagnose, cannot be cured even by an operation.

Heubner believes that Sonnenburg is inclined to look upon the diagnosis too seriously, for we quite frequently see a definite cure even without an operation. The advice is undoubtedly good— *Ubi pus, ibi evacua ;* but the worst forms are frequently those in which the indications for an operation are difficult to find. Heubner's advice is to operate at once even in those cases where no swelling is present, regardless as to whether fever is present or not, as these cases have an unfavorable prognosis under all circumstances. Finally, Karewsky observes that the reason why the statistics of the surgeon are unfavorable is because the latter is only called to the worst cases ; and admits also that the diagnosis of this disease in children may, during the first few days, be difficult, on account of the absence of characteristic prodromes. Karewsky, contrary to Renvers, proposes to retain the name appendicitis as a characteristic one, and favours the performance of an operation also in diffuse purulent peritonitis, for the reason that the prognosis is very unfavorable under all circumstances.—*Pediatrics*, January, 1898.

Cinnamic Acid in the Treatment of Tuberculosis.

—T. Heusser (' Therapeut. Monat.,' September, 1897) says that two hours after intravenous injections of cinnamic acid an increase of white corpuscles in the blood commences, which subsides at the end of twenty-four hours. In tuberculosis, aseptic inflammation develops around the tubercular centre, and in the third week a wall of leucocytes has formed around it, cutting it off from the surrounding tissues. Simultaneously the leucocytes commence to penetrate the necrotic tissues, and the bacilli at the end of a few months become difficult to detect, and disappear completely.

Heusser has treated twenty-two patients with cinnamic acid, injecting it into the gluteal region. In six cases, or 27·25 per cent., the lesions healed completely ; twelve cases, or 44·54 per cent., were improved ; one patient died ; and in three cases

the treatment was without result. Of the cases cured three belong to the class of chronic tuberculosis, with no cavities discernible, but numerous bacilli and moderate evening temperature; and three to cases with cavities without increase of temperature. Of the twelve cases improved, three belong to the first class and nine to the second.

The cinnamic acid is employed in the form of an emulsion, and thè first injection consists of a minim and a half of a 5 per cent. emulsion. They are made every second day unless the patient exhibits some unusual reaction, and the maximum dose is fourteen minims, which amount is administered every second day for several months, or until the patient presents no further symptom. Immediate effects from the injection do not usually present themselves. At the most there is a slight burning sensation at the site of the puncture. The patients often feel depressed, and in rare cases Heusser has observed congestion of the head and dizziness. After from two to four weeks of treatment there is an increase of appetite and weight; the fever is reduced, and the cough and the expectoration diminished. He has never noted evil consequences, though temporary drawbacks may occur.—*Medicine*, January, 1898.

Cold in the Ætiology of Diseases.—Chelmonski, in the ' Deutsches Archiv für klinische Medicin,' 1897, p. 140, reaches the following conclusions (' Gazette hebdomadaire de médecine et de chirurgie,' December 19th):

1. Taking cold, in the ordinary acceptation of the term, does not exist. 2. The ætiological *rôle* of cold is very subordinate; in inflammatory affections it does not figure, except as a predisposing cause. 3. Chilling is dependent upon the action of thermic agents that are ordinarily difficult to avoid. 4. The mode of reaction of the skin against the thermic excitation produced indicates whether the individual may, in certain conditions, contract a cold. 5. The degree of tendency to colds is not a constant property of the individual. 6. Old persons, those attacked with intermittent fever, and individuals suffering from renal affections seem to be more subject to taking cold. 7. There does not exist any relation between the tendency to colds on the one hand, and the condition of nutrition and the thermic sensibility on the other. 8. Individuals may be protected from diseases

caused by cold by developing, with appropriate means, the power of reaction against the thermic influences.—*New York Medical Journal*, January 15th, 1898.

REVIEW.

Mastoid Abscesses and their Treatment. By A. BROCA, M.D., Chirurgeon des Hôpitaux de Paris, Professor Agrégé à la Faculté de Médecine, Membre de la Société de Chirurgie; and F. LUBET-BARBON, M.D., Ancien Interne des Hôpitaux de Paris. Translated and Edited from the French by HENRY J. CURTIS, B.S., M.D.Lond., F.R.C.S. Eng., Assistant in the Ear and Throat Department, University College Hospital; with Eleven Coloured Illustrations. (H. K. Lewis, London.)— The translator of this work has done his part in an admirable manner, and in his preface states as the reason for having translated the work that the authors, Professors A. Broca and Dr. F. Lubet-Barbon, have written such an admirably clear account of the subjects included under the above title, from clinical, pathological, and therapeutical standpoints, with careful descriptions in detail of the more modern operations, including those of Schwartze and Stacke. On reading this volume all will agree that it is, as Dr. Curtis points out, well worthy of translation into English. The work is further rendered of value by the eleven coloured illustrations of original drawings by Mr. Rickman J. Godlee from preparations by Mr. Thane. From an anatomical point of view these illustrations are clear and accurate, and materially assist the reader in following the authors' descriptions. The work represents the practical conclusions the authors have arrived at from the personal experience of 146 operations. The arrangement of the book is in four divisions: the first is devoted to mastoid abscesses; the second to mastoid fistulæ; the third to the consideration of middle ear chronic suppurative inflammation; and the fourth to results. This publication will clear away the confusion which seems to have surrounded these points; and although it is hardly to be expected that all the conclusions of the authors will be accepted in their entirety, still the thoroughness of the work, the excellent preparation and elucidation of the subjects, and the precision and completeness of the descriptions of modern views and methods must ensure a wide sphere of influence for the writers' teaching.

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NOTICE.

ON THE TREATMENT OF UTERINE MYOMATA (FIBROIDS).

BY

J. BLAND SUTTON.

LECTURE I.—PATHOLOGICAL.

ALL attempts to cure uterine myomata by medical and electrical methods have been conspicuous failures, so that patients are in the great majority of instances obliged to seek the aid of surgery. Happily they do not seek in vain; so I propose in these lectures to describe those surgical methods which have given me the best results; but before entering into the details of the operations it will be necessary to briefly discuss the pathology of these remarkable tumours.

Myomata (fibroids) are composed primarily of unstriped muscle-fibre, and occur in the uterus as encapsuled tumours.

Though myomata arise in every part of the uterus, including the round ligament, they are more common in the body of the organ than in its neck. For clinical purposes they may be divided into two groups:

    1. Myomata of the body.
    2. Cervix-myomata.

The anatomy of each group requires separate consideration.

1. *Myomata of the Body of the Uterus.*

These grow in any part of the uterine wall, and may remain embedded within it, or project either on the serous surface of the uterus, or extend into and occupy the uterine cavity. It is convenient to express these conditions in special terms. Thus a myoma embedded in the wall of the uterus is described as being *intramural* (interstitial). When projecting into the uterine cavity it is said to be *submucous*, and when stalked it is called a polypus; when projecting from the peritoneal aspect of the uterus it is termed a *subserous myoma*, and may be pedunculated or sessile. Each of these varieties

may occur as a solitary tumour; very frequently subserous, intramural, and submucous tumours co-exist in the same uterus. In many specimens it is difficult to decide whether a tumour should be described as an intramural or a sessile subserous myoma (Fig. 1). It is well to remember that in this as well as in the other figures in these lectures the shape and relations of the tumours as shown in the drawings give no adequate notion of the distortions they produce upon the uterus.

Intra-mural myomata in their early stages resemble knots in a piece of wood, and on section often present a peculiar and characteristic

gain access to it, then gangrene is the inevitable consequence.

Submucous myomata.—As soon as a submucous myoma attains an appreciable size it projects into the cavity of the uterus, and leads to great thickening of its walls. Such a tumour may remain sessile, but it often tends to become stalked. Frequently the stalk lengthens enough to allow the tumour to be extruded from the uterus into, and even beyond the vagina. When this occurs the pedicle of the myoma becomes gripped at the mouth of the uterus, and this interferes with the circulation of the tumour, causing it to become œdematous, and finally
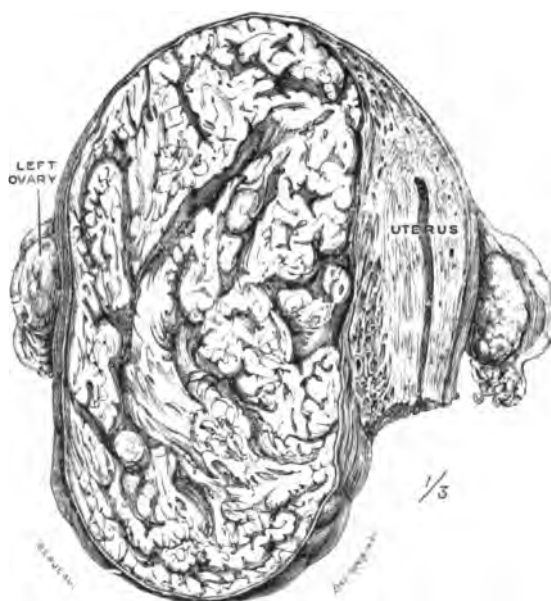
Fig. 1.—The body of the uterus in sagittal section, showing a large myoma traversed by narrow tortuous canals—probably lymph-spaces. The parts were removed by supra-vaginal hysterectomy: the patient had ceased to menstruate.

whorled appearance. In many instances the centre of the vortex is occupied by blood-vessels. There is no limit to the number of myomata in a uterus, nor to their growth. As many as forty may be present, varying in size from a currant to a cocoa-nut.

Often a myoma is apparently single, but on section is found to contain three, four, or more encapsuled nodules.

The capsule of a myoma is of vital importance, as the life of the tumour depends upon it. When this capsule is damaged, it leads almost invariably to necrosis of the tumour; and if micro-organisms

septic (gangrenous). It is well to bear in mind that when a uterus is occupied by a large myoma the uterine arteries often increase enormously in size, and branches of the artery which, under normal conditions, are of insignificant proportions may, when supplying a big myoma, be represented by vessels bigger than the radial artery at the wrist. The veins and often the lymphatics are correspondingly enlarged. Soft myomata are sometimes exceedingly vascular, and contain venous channels of such proportions that the tumours on section resemble a large cavernous nævus. Such tumours yield a loud murmur when auscultated.

Subserous myomata.—A single-stalked myoma may grow from the uterus and attain a large size even when its pedicle is narrow, but, as a rule, those which have thin and long stalks remain small. When many pedunculated and sessile subserous myomata grow concurrently, the uterus assumes a peculiar tuberose appearance. A solitary pedunculated subserous myoma is rarer than a solitary stalked myoma projecting into the cavity of the uterus.

It is useful to remember that *the narrower the stalk in proportion to the size of the tumour, the*

There are two varieties of cervical myomata. When a myoma arises in the tissues of the cervix and occupies the cervical canal it is termed *intra-cervical.* Should it arise from the cervix and burrow into one or both mesometria it will not expand the cervical canal ; this variety may be called a *subserous cervical myoma.* A typical intra-cervical tumour is shown in Fig. 3 ; it is oval in shape, and the uterus is perched like a hillock on its summit. The myoma weighed five kilogrammes ; the fundus of the uterus reached the level of the navel.

The topography of a cervix-myoma is best
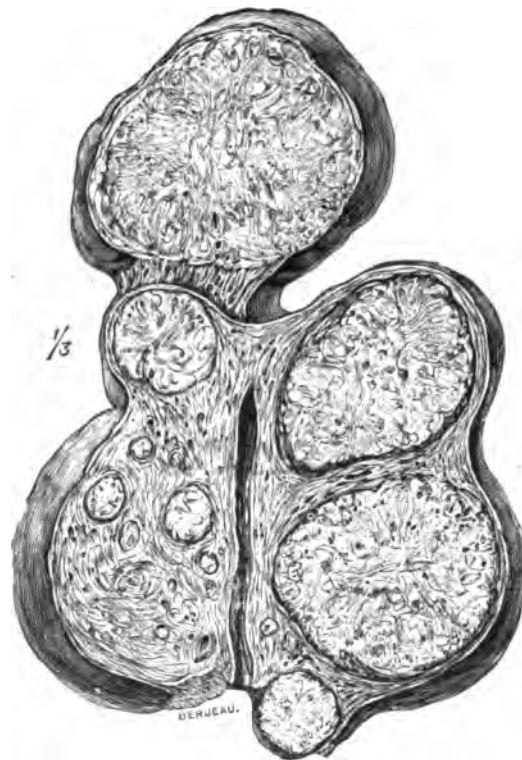
Fig. 2.—Uterus in sagittal section, showing multiple myomata. The parts were removed from a single woman 45 years of age, by supra-vaginal hysterectomy.

greater is its mobility and liability to axial rotation. Very mobile subserous myomata are a source of much error in diagnosis, and are often mistaken clinically for ovarian tumours.

2. *Cervix-myomata.*

A myoma may arise in the tissues of the neck of the uterus ; such a tumour may attain very large proportions, and possess very peculiar features.

displayed when the parts are shown in section (Fig. 4). This variety of myoma presents, in sagittal section, a characteristic elliptical outline, and the expanded walls of the cervix extend like a thin capsule around it.

The subserous variety of cervix-myoma often attains large proportions, and pushes the uterus high above the pelvis ; it may extend into one or both mesometria, and mould itself to the true pelvis. Such tumours present, like the intra-cervical variety,

a characteristic elliptical section (Fig. 5), but their exterior is usually irregular and even tuberose.

Of course the ovoid shape of cervix-myomata is determined by the osseous boundaries of the true pelvis. In a woman with an average pelvis, the pelvic diameters at the level of the middle of the cervix measure with the soft parts in position about 10 cm. (4 in.); hence a cervical myoma, whether intra-cervical or subserous, will completely occupy the true pelvis and exert injurious pressure on the ureters, but more especially on the urethra.

A careful investigation of some very large tumours

tumours are yellowish white on section; soft speci-mens approach the normal colour of the uterus. As a rule, soft myomata grow rapidly and are very vascular; the softest tumours are those which have undergone secondary changes (myxomatous degeneration). It is by no means uncommon to find a uterus beset with many myomata, some of which are very hard; one or more may be cal-cified, others are as soft as the uterine wall, whilst one or more may be diffluent in the centre, and perhaps the biggest one among them is gangrenous.

Secondary changes.—Uterine myomata of all
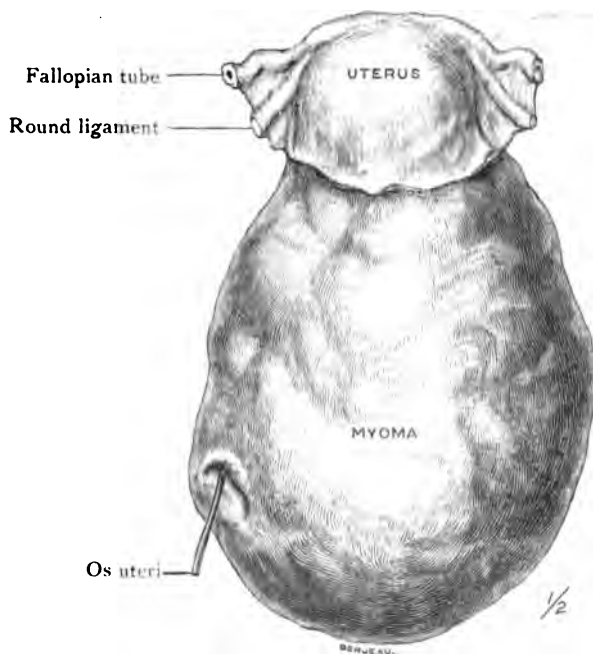
Fig. 3.—An intra-cervical myoma. From a sterile married woman 40 years of age.

Fig. 4.—An intra-cervical myoma in sagittal section. From a woman 52 years of age, mother of four children; menstruation was active.

described as myomata arising from the muscular tissue of the mesometrium has satisfied me that many of them arose from the cervix; but I have found them growing from the mesometrium quite distinct from the uterus, and also from the round ligament.

A myoma of large size has been observed growing from the rudimentary horn of a unicorn uterus (Amand Routh).

Uterine myomata differ much in texture; some are as hard as cartilage, others as soft and succu-lent as an orange: between these extremes every degree of hardness or softness occurs. Hard

kinds are liable to secondary changes; of these the chief are mucoid degenerations and calcification.

1. *Mucoid changes.*—Large myomata are espe-cially liable to soften in the centre, and in some instances the change takes place so extensively that the tumour is converted into a spurious cyst. Myomata of this kind are sometimes called "fibro-cystic tumours" (Fig. 6).

The actual conversion of the tissue substance into mucin is preceded by œdema of the connec-tive tissue, and the cells assume the spider-like form characteristic of myxomatous tissue. Mucoid changes in uterine myomata are usually accom-

panied by a rapid increase in the size of the tumour, and often furnish the clinical signs of an ovarian cyst.

Calcification.—Old uterine myomata of all varieties are liable to become calcified, especially the hard, slow-growing kind.

Collections of fat have been found in the centre of submucous myomata, but they are very rare. An excellent example is preserved in the museum of St. Bartholomew's Hospital, London.

Concerning the cause of myomata we are in by reliable observers in the uteri of lower mammals, either domesticated or wild.

In regard to the rate of growth of uterine myomata we are very ignorant. I know of only one observation on this matter which can be referred to with certainty. Stratz, in an interesting monograph, 'Die Frauen auf Java,' Stuttgart, 1897, writes on page 74 that in February, 1890, he removed a right ovarian dermoid from a woman 42 years of age. The left ovary and the uterus were of normal size and consistence. Nothing could be felt in the
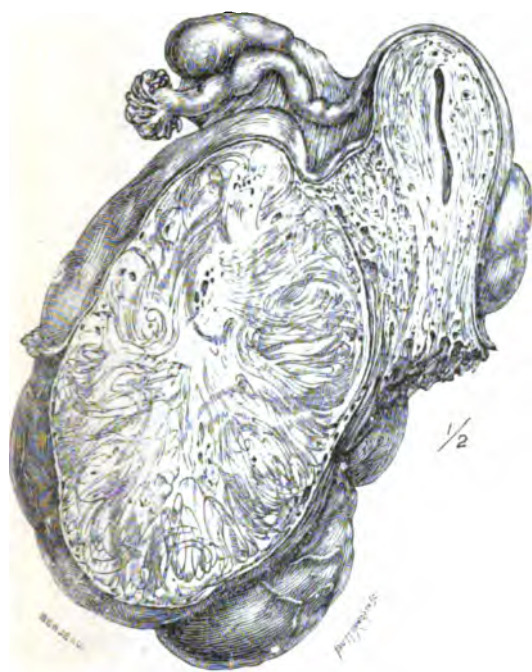
Fig. 5.—A subserous cervical myoma in sagittal section. From a woman 32 years of age, mother of two children.

Fig. 6.—A sessile subserous uterine myoma which has undergone extensive mucoid degeneration. From a sterile married woman 37 years of age.

absolute ignorance, and it is strange that they should arise so frequently in the uterus, yet be so rare in other hollow muscles, such as the bladder, œsophagus, stomach, intestine, and heart. A closer study of the facts only leaves us to wonder why myomata should be so common in the body and neck of the uterus, whilst they are almost unknown in the Fallopian tubes. But, strangest of all, these tumours are almost peculiar to women (and though so common in white races are even more frequent in the black women of North America), for very few cases have been described

uterus during the operation. In August, 1893, the uterus was hard and tuberose with myomata, and reached to the navel. Its cavity measured 15 cm.

Hence, with our present knowledge, we find it absolutely impossible to reply to the question so often asked by patients, How long has my fibroid been growing? with any reasonable certainty, and I fear that when these patients get a candid answer they wonder at our deep ignorance.

A CLINICAL LECTURE ON THE BLOOD.

Delivered at the Central London Sick Asylum.

By GEORGE OLIVER, M.D.(Lond.), F.R.C.P.

LADIES AND GENTLEMEN,—The subject of the blood is a very extensive one, and to-night I shall confine my remarks to two special lines : first, the methods for the clinical examination of the blood for the purpose of determining the percentage of hæmoglobin and blood-corpuscles ; and secondly, some results, physiological and clinical, obtained by the use of the apparatus which I shall specially describe.

I shall speak first of the methods and then of the results.

First, then, with regard to the modes of determining hæmoglobin. The practical methods hitherto employed are founded upon what is called the colorimetric principle ; that is, upon the estimation of the depth of colour. Those now most favoured are Gowers' and von Fleischl's. In Gowers' method there is a colour standard, and a tube into which is discharged 20 c.mm. of blood, which is diluted with water until it is of the same grade of colour as that of the standard ; then the height of the column indicates the percentage of hæmoglobin. This method is adapted for use in daylight—not in artificial light,—though I have seen some rather important investigations into the quantity of hæmoglobin conducted by it in artificial light. If you estimate the amount of hæmoglobin by artificial light, you will find that the figure does not in any way correspond to that obtained in daylight. I should here premise that every colorimetric method designed to determine the amount of hæmoglobin by one light or the other, should not be used indifferently with either. The drawbacks to this method consist in requiring a rather large quantity of blood,—20 c.mm.—and in furnishing a fairly large margin for the personal equation by the observer in determining when the reading should be taken. In von Fleischl's apparatus, which is the one largely used abroad, the light (artificial) is reflected from a white disc through the solution of blood contained in a small chamber by the side of which a coloured glass wedge is run,

until the depth of tint of the former is similar to that of the latter. The great drawback to this method is that you are always observing a range of 20° on the standard—namely, 20° higher on the right margin of the field of view than on the left. Hence the personal equation in observation is liable to be large, although only a small quantity of blood (namely, 5 c.mm.) is required. The next apparatus which I wish to bring under your notice is that which I devised two years ago. I have found it also convenient to follow the colorimetric principle, but my method of applying it makes the test a much more exact and sensitive one. This result has been attained mainly by employing reflected (or doubly transmitted) light instead of the singly transmitted light hitherto used, and by arranging the blood solution and the standard in exactly the same physical form—namely, that of perfectly plain discs. When the apparatus was disposed on these lines it was observed that the finest shades of difference in coloration were detectable. In setting up the standard I availed myself of Mr. Lovibond's admirable system of matching and measuring colour by means of graded coloured glasses. You may obtain a detailed description of the apparatus from Mr. Townsend, Manager of the Tintometer Company, 6, Farringdon Avenue, E.C. I also found it a great advantage to split up the whole of the standard into a series of subordinate standards, beginning at 10° of hæmoglobin, and finishing at 120°. Each of these, however, requires to be separately set up, for it was discovered that blood, like many other coloured substances, such as the aniline dyes, have what is called a " specific colour curve ; " that is, when, for example, the solution represented by 100° is diluted 50 per cent., the colour components—in the graded glasses—do not correspond with half those which measured the colour at 100°. The standard, therefore, should not be a uniform gradation as in von Fleischl's glass wedge, but should follow the specific colour curve of hæmoglobin. The standard, as you see, consists of two slabs, each presenting a series of subordinate standards which are separated by 10°. You may ask, how do you read between these tens ? That is done by superimposing on any particular standard, the glasses which correspond to all the units up to nine, so that in any particular observation, in which the determination of the hæmo-

globin is not effected by one of the 10° grades, the standard may be built up until it exactly matches the blood. These additional glasses are called riders. The standard I prefer is set up for artificial light; though one adapted to daylight may be obtained.

I must now refer to the pipette which measures the blood. Accurate hæmometric observation, whether applied to the determination of the hæmoglobin or of the corpuscles, would, of course, become impossible were we unable to obtain a uniformly definite measurement of the blood; and the construction of a pipette for that purpose has always presented a difficulty. I have obtained the best results with one consisting of a solid piece of glass which uniformly measures off the exact amount of blood, and is self-filling. The end of the glass presented to the blood is well polished, so that any traces of blood on the outside can be easily removed by the finger. If you make a number of observations on the same blood with this pipette, you will obtain a uniform reading throughout. Another important practical advantage in the pipette, which, of course, greatly contributes to its accuracy in providing a uniform measurement of the blood, is that it can be thoroughly dried out by passing through it a needle threaded with darning cotton. This cannot be done with some of the pipettes now in use.

Another point of considerable importance in contributing to accurate and delicate reading also became apparent, namely, to adopt some arrangement by which all extraneous colours and light are excluded from view. I devised the camera tube I now show you for that purpose. With this contrivance it is quite easy to differentiate 1° of hæmoglobin, whereas with the older methods it was not always easy to distinguish with certainty 5° or even 10°. Therefore this improved method enabled me to make a large number of physiological observations with the view of ascertaining how far the blood varies in healthy subjects at different periods and under different conditions.

Next with regard to the estimation of the corpuscles. There are two methods much in use, namely, enumeration and centrifugal separation. First, the enumeration method, which is undoubtedly a very valuable one; but, as you know, it is very tedious and requires a great amount of time. Then, even though it be carefully carried out, there is a considerable margin of error. In adopting the ten-square enumeration I have found it has sometimes reached 10 per cent. The other method, which has been more particularly employed of late years, is known as the centrifugal method, by which a portion of blood is put into a tube, and the corpuscles are separated from the fluid by a centrifugal machine. The results of these two methods do not correspond. The size of the blood-corpuscles has an effect upon the reading of the centrifugal apparatus; really what you obtain by this method is not the number but the volume of blood-corpuscles. The plan I will now show you does not follow strictly the enumeration method, it is more akin to centrifugal separation; but it is much simpler and easier to carry out, requires a much smaller measure of blood, and is, moreover, more delicate in its results, and rapid. It is founded upon the principle of opacity, and therefore is founded upon the employment of light. I found that the most convenient way of applying this consisted in washing into a flattened tube 10 c.mm. of blood with Hayem's solution so as to fix the blood-corpuscles, and therefore to produce an opacity. The method consists in having a small wax candle fixed upon a shelf. The observer stands at a distance of about ten feet, with the long diameter of the tube which contains the blood and Hayem's solution towards the candle, forming a frame for the tube with his forefinger and thumb, and looking through the tube steadily at the candle, and noting whether anything can be observed. Nothing, of course, is observed until a certain point is reached, when an exceedingly delicate transverse line of light appears across the tube. This is caused by the longitudinal ribbing of the glass in the manufacture; the longitudinal fibrillæ in the glass, acting as lenses, produce a horizontal series of images of the candle. When the blood is washed in, this illuminated line is screened out of view by the blood-corpuscles; but when the dilution has just reached the point at which the reading should be taken, an exceedingly delicate thread of light appears across the tube, and the percentage of the corpuscles is indicated by the height which the column of fluid has attained on the scale marked on the tube. When this observation is repeated several times

with the same blood, the reading is found to be uniform. This mode of observation works well in practice. The white corpuscles count for nothing in this method in health; but in cases of leucæmia they, of course, disturb the reading of the red corpuscles, so that where there is a suspicion of that disease the microscope should always be used.

Now as to the results of observation with this apparatus; and first of all I will mention a few data respecting normal blood. The first fact which I ascertained with certainty in health was this :— that the blood is not constant, but is variable in two directions, namely, in the proportion of the hæmoglobin to the corpuscles; and secondly, in the percentage of the corpuscles in a measured volume of blood. These elements vary a good deal at different periods of the day, a fact which it is important to bear in mind in making clinical observations. In normal blood—that is, before any food is taken in the morning—the instruments are so arranged that the hæmoglobin reading exactly corresponds with the percentage of corpuscles, and would be expressed by say $\dfrac{95}{95}$ or $\dfrac{100 \text{ HG.}}{100 \text{ C.}}$ the upper figure representing the hæmoglobin and the lower the corpuscles. In the evening the reading would perhaps be $\dfrac{88}{92}$ or $\dfrac{92 \text{ HG.}}{96 \text{ C.}}$ showing that the corpuscles have lost a certain amount of hæmoglobin.

I have observed that changes in the blood are rapidly induced by the absorption of fluid, and by fluid transfer from the blood.

Perhaps the best example of temporary dilution is obtained by a full meal. Blood which before a meal may have registered $\dfrac{95 \text{ HG.}}{96 \text{ C.}}$ will probably an hour or so after a meal read $\dfrac{88 \text{ HG.}}{90 \text{ C.}}$; there is then more fluid passing into the blood, increasing its volume and diluting the whole of the corpuscles. The effects of exercise are mainly to concentrate the blood, by accelerating fluid transfer into the lymphatics, and then to cause a fall in the hæmoglobin value of the chromocytes—a fall which is rapidly restored by rest. I may point out in passing that Lloyd Jones has made a number of observations on the specific gravity of blood in health and disease. The specific gravity of the blood is largely affected by the proportion of blood-

corpuscles, and his figures correspond in an interesting way with those obtained by my observations determining the percentage of corpuscles in the blood by the cytometer tube.

I have here a diagram representing two consecutive series of night and morning variations in the blood—one being that of the corpuscles, and the other that of the specific gravity after Lloyd Jones. You observe that both records, independently determined by Lloyd Jones and myself, follow exactly the same lines.

I show you here another diagram giving a consecutive night and morning record of the blood-corpuscles and of the hæmoglobin. In the evening the fall of hæmoglobin is very much greater than that of the corpuscles, so that there must be a corresponding fall in value, which is doubtless the result of the physiological work of the day; but this daily loss of hæmoglobin from work is fully restored by the rest and sleep at night. I also show you in this diagram the results of some observations made on my own blood during a visit to Davos Platz, indicating the remarkable effect of the dry air of altitudes in depriving the blood of a certain portion of water, and in this way raising the percentage of the corpuscles. Here you observe not only that the night and morning curves are raised in a most pronounced degree above those recorded in London before and after the visit, but that the difference between them is less. All these facts, and many other similar ones which have been revealed by the use of the apparatus I have described, show that the blood is not a constant fluid; it varies from day to day and even from hour to hour. It would seem from these observations that the variations which are apparent in the blood within comparatively short periods (such as from one to twelve hours) are mainly due to the transfer of water to and from the blood. Water is the most variable constituent, and hæmoglobin is less constant than the corpuscles. These daily variations make it practically impossible to establish with certainty an average normal reading of the percentage of hæmoglobin and corpuscles at some particular figure; and besides these hourly and daily fluctuations common to all in health, a certain amount of latitude must be allowed for what may be termed the "personal standard." I have found it to be a good working rule to regard as normal the readings from 90 to 100 for

men, and those from 85 to 95 for women. My observations therefore confirm the experience of others in regarding the blood of women as less rich in hæmoglobin and corpuscles than that of men; but they point, however, to a smaller difference than that which has hitherto been usually accepted.

The blood is most concentrated in the morning before food, when, as a rule, in good health it will touch the higher limit of the normal range (100 for men and 95 for women). So much for the average normal area; you will, however, now and then meet with persons in perfect health whose blood will habitually read a few degrees below or above it, but such readings will indicate merely a sort of individual standard, like a certain pulse-rate or a certain arterial pressure, somewhat abnormal in relation to others but normal for the individual.

What is the bearing of all this upon clinical work? Well, it has not an appreciably disturbing influence, providing our observations are made at about the same period of the day, especially with regard to distance from meals, and providing the normal area is broadly viewed as a somewhat elastic one, embracing some 10°. I have already told you that these methods, inasmuch as they are easy to apply and are time-saving, are well adapted to clinical work; as a rule, the percentage of the hæmoglobin and the corpuscles can be taken within five minutes. This enables one to extend observations on the blood over a wider field than has hitherto been possible. The data I have collected have shown rather an interesting fact, namely, that the appearance of the patient is not always strictly in accordance with the blood condition. I have every now and then been much surprised to find that a somewhat florid person has a comparatively low reading of blood; generally these cases show not so much a difference in the value of the blood as shown by the comparative amount of hæmoglobin and corpuscles, as a greater dilution of it. For instance, in women it is not very uncommon to read $\frac{75}{75}$ or $\frac{80 \text{ HG.}}{80 \text{ C.}}$ without any appearance of anæmia at all, and the individual may be capable of doing a fair amount of work. That leads me to say that there is a missing factor in all blood observations, and that is, we know nothing of the volume of the blood,—we are perfectly ignorant as to whether the volume is increased or diminished;

it is quite probable that in such cases as these the blood is increased in volume by being merely diluted with water beyond the average degree, and is in all other respects quite normal. But this supposition cannot be submitted to the test of observation. It is just possible that this thinness of blood is the first stage in the chlorotic condition. These cases of spanæmia are much more common in women than in men, and that agrees with what we know of chlorosis. On the other hand, I have seen very pale subjects with very concentrated blood. Here we have a condition which may be called apoplasmic, that is, a reduction in the volume of the blood plasma. It may be due to a deficient ingestion of water, or to an increased discharge of water from the blood.

Now let us take anæmia. In cases of chlorosis, which I suppose may be regarded as the most typical, we have a low—sometimes an extremely low—reading of hæmoglobin, even down to 15, 20, or 25. The volume of the corpuscles may be equally low, but as a rule it is 10° or 20° higher than the hæmoglobin. In many of these cases it will be found that the corpuscles are very small, so that the volume comes out somewhat smaller than the number. Now, an interesting question arises from this; namely, how far a chlorotic blood is a diluted blood, or what part water plays in the condition of chlorosis? It has been hinted by some observers that there is a larger volume of blood in chlorosis than is normal with the individual, and that the presence of this water in the blood greatly aggravates the indications of anæmia as read by the amount of hæmoglobin and corpuscles. I think it highly probable that there is some truth in this view, which, moreover, probably explains why such patients exist, and may even work, with strikingly small proportions of hæmoglobin and corpuscles in their blood; there is probably the increase of volume of the liquor sanguinis, as well as the impoverishment of the red corpuscles. The opposite condition to chlorosis is that in which you get a concentration of corpuscles causing a fall in value.

It is a curious fact, but one which I have frequently observed, that when the blood becomes apoplasmic, the percentage of the hæmoglobin, though it may even read very high, falls below that of the corpuscles, e.g. 10 or 15 points; so

that an observer relying on observation of the hæmoglobin alone is apt to regard such blood as normal or richer than normal, and little suspects that there is some anæmia present. Moreover, I have repeatedly observed that when in such cases the concentration of the corpuscles becomes reduced to within the normal area, the anæmia passes quickly away—the hæmoglobin and corpuscles read alike as in health—without resorting to hæmatinic treatment. I therefore conclude that this form of anæmia is intimately associated with a too concentrated state of the liquor sanguinis.

These cases, unlike those of chlorosis, are more common in men than in women. This experience corresponds with the observations of Lloyd Jones in his recently published work on 'Chlorosis.' This apoplasmic or concentrated form of anæmic blood was noticed as far back as 1854 by Becquerel and Rodier, who refer to cases of anæmia in which the blood exhibited a high specific gravity.

In anæmia these ready methods enable one to follow with considerable interest the changes which take place as the result of treatment. One may frequently observe two stages through which an anæmic case improves. In the first stage, in chlorosis the readings of the hæmoglobin and of the corpuscles, while rising, approximate; and a strictly spanæmic condition may be read at 50°, 60°, or 70°. It is quite possible that the blood in this stage is normal, but diluted. To obtain a permanent result it is necessary to continue the treatment until the hæmoglobin and corpuscles are brought within the normal area. To this end it is necessary that the treatment should be prolonged; in many cases it needs to be very prolonged, or else the spanæmia increases and the case falls back to the state of chlorotic anæmia. I should have mentioned the influence of rest upon the value of the blood in anæmia. I have shown that it is through the night that the blood-corpuscles are restored, and that physiological rest generally means restoration of the blood. Now, in anæmia it has been recognised that three weeks in bed is a very valuable mode of treatment. Work reduces the value of the corpuscles, and it has been observed that in chlorosis a very slight amount of muscular work may often prove most injurious. It is now obvious

why rest in anæmia does good and work does harm.

In the cases of apoplasmia, which are every now and then encountered, I have found these time-saving methods useful in definitely enabling one to follow the beneficial effects which frequently result from increasing the fluid supply, especially when in the form of distilled water (still Salutaris water), and with a saline such as chloride of potassium, and given on an empty stomach, as in the early morning and bedtime, and sometimes before meals. By this means undue concentration of the corpuscles, *e.g.* 115 or 110 per cent., may be observed to quickly fall in many cases to 90 per cent., or even lower, with an improvement in the general health and blood quality—the hæmoglobin relatively rising as the corpuscles fall. I have, however, observed that some cases of this type, such as in the early stage of cirrhosis of the kidney with high arterial tension and increased outflow of urinary water, and in sthenic gouty subjects without detectable renal disease, fail to respond to this treatment. I have found the cytometer tube to be a ready and useful clinical guide in adjusting the fluid supply, and that is just as important as the regulation of the solid dietary.

[Dr. Oliver then gave a demonstration of his methods of testing the blood.]

The Treatment of Vertigo known as Menière's Disease.

The Treatment of Vertigo known as Menière's Disease. — By de la Tourette ('Semaine Médicale,' 1897, p. 301, No. 38).

The writer reports the case of a man 58 years old. The patient, who had previously been quite well, was taken suddenly one morning in June, 1893, with a violent vertigo, having all the features of Menière's disease. Following this the patient complained of a persistent noise in the right ear, and of a continuous vertigo, for which he was given quinine in large doses with excellent results. Apropos of this case, the author takes up the history, causation, lesions, and diagnosis of Menière's disease. He points out the *rôle* played by hyper-excitability of the labyrinth in the production of vertigo, and dilates on the efficacy of quinine in the treatment of the auricular forms of vertigo. The medicament should be given in ten-grain doses once or twice a day for a period of at least a fortnight.

The Post-Graduate, January, 1898.

MEETING OF THE SOCIETY OF ANÆSTHETISTS,

At 20 Hanover Square, January 20th, 1898.

The President, Dr. DUDLEY BUXTON, in the Chair.

Mr. ALEXANDER WILSON read the following paper, entitled "Resuscitation in Emergencies under Anæsthetics."

MR. PRESIDENT AND GENTLEMEN,—The gradual and continued inhalation of an anæsthetic, such as chloroform, produces certain definite effects on the nervous system. There is first a period of cerebral excitement with struggling, followed by a gradual paralysis of the various nerve centres.

This paralysis, in its onset and order of progression, follows tolerably closely the law of dissolution,—that is to say, the latest acquired movements or functions are the first paralysed, and the functions pertaining to the fundamental system resist the paralysing action of the drug for some considerable time, the last to disappear being those of respiration and circulation. "Emergencies under anæsthetics" occur from some untoward effect of the muscular disturbance during the period of excitement. They more commonly happen from some interruption in the orderly course of the anæsthesia, due to the premature and unexpected paralysis of the circulation or respiration, and arise from some peculiarity in the individual or irregularity of the administration.

In the first stage of anæsthesia, characterised by excitement, accidents may happen from the excessive muscular action interfering with respiration and causing asphyxia. The mechanism of this struggling is simple: the higher cerebral centres, being excited and stimulated, originate these violent co-ordinate movements in response to some misinterpreted stimulus. The closure of the glottis and fixation of the chest is merely an exaggerated degree of the normal fixation of the thorax, which is a necessary part of every considerable muscular effort. This holding of the breath is apt to be prolonged because the centres regulating it have passed beyond the control

of the will, from the concomitant paralysis of the higher centres.

A somewhat similar closure or spasm of the glottis also occurs from reflex irritation, apart from contraction of the chest muscles, and is a common feature during the performance of operations in an insufficient degree of anæsthesia.

Interference with the respiration from these causes is generally of short duration and of no great importance; but in a few cases, if unrelieved, it causes asphyxia and paralysis of the heart from mechanical over-distension, combined with the effect of the anæsthetic, and it may leave certain after effects.

I am acquainted with two cases in which a mitral systolic murmur was developed from it, during the administration in one case of chloroform, and in the other of ether. In the severe cases, which do happen, but of which I have had no experience, tracheotomy is required; in slighter cases, during the initial stage of anæsthesia, cold affusions to the chest or nitrite of amyl may be effective in stopping the spasm.

In sudden cardiac paralysis with engorgement of the right side of the heart, bleeding from the external jugular vein is indicated, along with other measures for restoring the heart, which will be referred to later.

It seems hardly necessary to do more than mention emergencies arising from mechanical obstruction in the air-passages produced by foreign bodies, or that caused by the falling back of the tongue. The treatment of the one, and the means for the avoidance of the other, are so well recognised that it is useless to discuss them. I shall therefore pass to a consideration of the emergencies arising from the excessive and unexpected action of the anæsthetic on the vital centres exhibited by a paralysis of the circulation and respiration.

The immediate consequence of failure of the circulation is an interruption of the normal nutrition of the nerve centres from the deprivation of blood, which by itself may cause their death, independent of any action of the anæsthetic.

Resuscitation in these emergencies is in the first instance directed to the counteracting of the effects of this deprivation of blood, and in the second place to the restoring of the respirations and circulation. In practice these two indications are carried out simultaneously.

The various measures devised for the attainment of these ends may be grouped into six divisions according to their mode of action.

1. External applications of an irritating nature, having for their object the exciting of respiratory movements as a result of reflex action, such as cold applications to chest, Corrigan's button to epigastrium, hot sponge to perinæum, irritation of nostrils by ammonia, &c.

2. Procedures of a similar nature which originate respiratory movements,—rhythmical traction on the tongue, dilatation of the sphincter ani.

3. Direct mechanical or electrical stimulation of the heart by pressure, rapid percussion, faradisation, acupuncture, position.

4. The performance of natural functions by artificial means, as artificial respiration, and, as an adjunct to it, tracheotomy.

5. Measures to counteract the effects of failure of the circulation, which have for their object the raising of the general blood-pressure, or the determination of blood to the vital nerve centres and organs, e.g. transfusion, copious rectal enemata, pressure on abdomen, applying Esmarch bandage to the limbs, the dependent position, artificial respiration.

6. Drugs introduced subcutaneously for the purpose of acting on the circulation or as antidotes to the anæsthetic,—nitrite of amyl, strychnine, atropine, ether, digitalis.

1. In the first and second class benefit is expected from the power external applications, such as cold or heat, possess of producing reflex action in the healthy individual. The principle underlying these methods of treatment depends upon the unequal degree of resistance the different nerve centres exhibit towards the anæsthetic. It is sought to reach the respiratory centre by means of some widely diffused or intense stimulus, transmitted through some unparalysed tract or nerve centre, and so excite reflex respiratory action. To obtain this action, a certain considerable degree of irritability or vitality must be present in the transmitting nerves and nerve centres, a degree of vitality which in the majority of cases of anæsthetic emergencies is absent. If a patient is sufficiently anæsthetised to be oblivious to sensation, it is not evident how a peripheral stimulus of this class can be of any avail in eliciting reflex action. As the desired effect can be more certainly

achieved by mechanical means, it is not advisable to waste time in the trial of such measures. If they are of use, it is in cases where there is a very slight degree of narcosis (where paralysis of the respiration or circulation sets in early), in the initial stage as already mentioned, or during recovery from the anæsthetic. This is borne out by the fact that in patients moderately under the influence of an anæsthetic such external applications appear to have no effect one way or another.

2. Includes measures which aim at provoking reflex respiratory movements by mechanical means, the chief of which are rhythmical traction on the tongue and forcible dilatation of the sphincter ani.

As regards the traction on the tongue, I do not understand its action, nor do I see how it can be a respiratory stimulant. If the tongue has fallen back, and is obstructing respiration, it is apparent that pulling it forwards will be synchronous with a noisy inspiration ; in the same way, should there be feeble respiration, pulling the tongue backwards and forwards, by alternately obstructing and freeing the air-passage, will produce the apparent effect of stimulating respiration. Apart from these conditions I fail to see how, in a patient with respiratory paralysis, this manœuvre can be beneficial, as in an unconscious patient such a proceeding has no appreciable effect other than clearing the air-passage and permitting free ingress of air.

The employment of dilatation of the sphincter ani as an excitant of respiratory movements is based on the circumstance that interference with the anus provokes reflex expulsive efforts. Its mode of action is as follows :—Normal dilatation of the anus is associated with an expulsive effort, conversely any mechanical dilatation of the sphincter ani produces a similar expulsive effort, which in the conscious subject is controlled by the will. Remove the will-control by a minor degree of anæsthesia, and dilatation excites a violent expulsive effort, with evacuation of the rectal contents. This effort is associated with closure of the glottis, fixation of the chest, and congestion of the face, &c., and as a necessary consequence of this slight degree of asphyxia there follows a deep inspiration. This affection of the respiration in response to dilatation varies within wide limits, according to the stage of narcosis and the state of the sphincter. With a feeble, easily dilated muscle it may be absent,

while in a strong muscular subject it will be very marked. In profound narcosis it will be absent, or represented only by an abortive expulsive effort, indicated by a crowing inspiration due to a partial closure of the glottis. This relation between the sphincter and the respiration must be familiar in all its varying phases to every one who has had experience in rectal operations. As a mode of resuscitation it would be of value only as a means of raising the blood-pressure in the head were it possible to make it act; but as it is uncertain at all times, and ineffective in moderately deep narcosis, it may be discarded in favour of more certain methods.

It must also be admitted that there may be some element of danger in this treatment. I have seen considerable trouble from severe spasm of the glottis set up by dilatation of the sphincter, and one case in which the sphincter happened to be forcibly dilated at the very moment of the onset of the respiratory failure from chloroform; it had no effect either in provoking respiration or in averting the fatal issue.

3. Of the methods in vogue for the direct stimulation of the heart the chief are pressure, rapid percussion, faradisation, acupuncture, and hot applications to præcordial region.

The selection of a reasonable method for stimulation of the heart is beset with difficulties. For example, when the pulse gives evidence, from its absence or feebleness, that the circulation is failing, we do not know whether this failure is due to mere inhibition of the heart's action or to actual paralysis of the heart muscle, or whether the stoppage is merely caused by the heart having nothing to work upon from extreme fall in blood-pressure due to vaso-motor paralysis.

At the same time, with one exception, we do not know how far, if at all, many of these remedies reach the heart itself, nor do we know the exact effect they would have did they reach it.

In faradisation of the cardiac region it is certain that none of the current reaches the heart, and if an ordinary needle is thrust into the heart tissue most of the current is lost in the chest muscles. Suppose an insulated needle does actually penetrate the heart muscle, would the transmitted faradic current cause a co-ordinate contraction in any way resembling a normal one? Considering the complicated muscular and nervous arrangement of the

heart this is very doubtful. For similar reasons no good can be expected from acupuncture.

In external hot applications, the body is a too bad conductor of heat for any of it to reach the heart; but where there is some circulation it may have some action, and where there is sensibility it may act in a reflex manner.

When one constantly sees extensive dissecting operations, and others involving the use of the cautery, performed in the cardiac region within the close vicinity of the heart without affecting its action, one becomes sceptical as to the influence on it of external applications such as heat.

Of rapid percussion over the cardiac region I have had no practical experience. The sudden dangerous effects of a blow over the heart are so well known that it is difficult to imagine how a rapid succession of even light blows can resuscitate an almost imperceptibly acting heart.

The structure and mode of action of the heart give some indications of the one line of mechanical treatment most likely to be beneficial, the value of which is also borne out by experiment, viz. intermittent pressure.

The heart is a muscular bag composed of innumerable muscles, controlled by certain intrinsic nerve centres, which by their co-ordinate action produce a uniform contraction—which contraction is excited by the presence of fluid in the cavities of the organ in a certain quantity and under a definite pressure.

It cannot work on an insufficient amount of blood, and it fails equally when over-distended. It is therefore to a large extent at the mercy of the arterial tone and the respiratory movements, and no treatment can be useful which does not at the same time influence these factors. It has repeatedly been shown by experiment that gentle direct intermittent pressure on a failing heart renews its contractions, and I have reported two cases in the human subject in which an equivalent treatment was beneficial. This direct manual compression is, of course, not available; but something can be done nearly as good. If artificial respiration is performed so as to compress the ribs in a compressible chest, the heart may be emptied and its contractions assisted to a certain extent, while the blood-pressure will be kept up, and the circulation through the lungs made easier. In rigid chests this is not easy of attainment, but

pressure on the epigastrium should be tried, and any procedure likely to raise the pressure in the chest.

These methods will probably be useful in nearly all cases of failure of the circulation, whether it be due to primary cardiac failure, or secondary to vaso-motor paralysis.

The influence of the position of the body on the heart is not yet clear. We have it on good authority that inversion distends the heart and the upright position empties it, while equally reliable observers are certain that the reverse is the case. Probably a good deal depends upon the degree of arterial tone and the extent to which the blood in the vessels is under the influence of gravity.

4. The fourth class brings us to the measures which aim at the artificial performance of natural functions. The only one in this class is artificial respiration.

Respiration is primarily designed to accomplish an interchange of gases between the blood and the air; but the mere interchange of gases is not all that happens. The respiration is most intimately associated with the circulation, on which the respiratory movements have a marked influence through the blood-pressure. Dr. Bowles in one of his valuable papers points out how little air is required for the purpose of maintaining life when the vital functions are lowered by drowning, and we may add also by an anæsthetic. In failure of the respiration from an anæsthetic it is not the mere absence of oxygen, consequent on the cessation of breathing, that endangers the patient; neither is it the mere admission of air, and therefore of oxygen, into the lungs that is the chief factor in resuscitation.

I may go further, and say that in some cases it is not the air at all, but the mechanical effects of artificial respiration, the filling of the lungs and compression of the chest, that do most good by their influence on the circulation, in stimulating the heart and keeping up the blood-pressure.

Under these conditions the objects in performing artificial respiration in an anæsthetic accident are threefold : to empty the lungs of all anæsthetic vapour by flushing out the air-cells with fresh air, to imitate the natural respiration, and above all to do this in a way that will at the same time assist the circulation.

Therefore a method which will quickly pass a large amount of air through the lungs, and which will at the same time enable pressure to be applied to the heart, should be most likely to afford good results.

There are two systems by which artificial respiration can be performed,—that of inflation, in which air is forced into the lungs and then sucked out, or forced out by pressure on the ribs ; and the commoner method, in which the cavity of the chest having been expanded, air finds its way in by the weight of the atmospheric pressure, and is in turn forced out by pressing on the chest walls. Though the means adopted are different, the ultimate effects are very similar. In inflation, air is forced into the lungs with the result of distending them, and raising the intra-thoracic pressure to the extent, if desired, of expanding the whole chest. The air is ejected by the natural elasticity of the lungs and chest wall, aided or not by manual pressure from without. By inflation there is thus an interchange of air in the lungs, at the same time that an intermittent uniform fluid pressure is brought to bear on the heart and great vessels. It is this pressure which is of so much value.

In the second plan, no appreciable pressure is brought to bear on the intra-thoracic organs during inspiration, but this is supplied in the course of expiration by external pressure on the chest wall, and cannot be so uniform in its effects.

Of the two, inflation would seem to promise the best results ; but in practice its performance is attended with difficulties, and of the 180 cases of successful resuscitation quoted in the Lancet Commission I find it was employed on only two occasions.

It is not necessary to enter into detailed descriptions of the various appliances employed in its performance, which have been invented by John Hunter, Sir Benjamin Ward Richardson, Dr. Fell, and others. An efficient apparatus can be extemporised out of an ordinary pair of bellows and a piece of rubber tubing, supplied with a tube for passing into the larynx, such as Schroetter's tube, which should fit the larynx tightly to avoid the escape of air.

Inflation is especially called for in individuals with rigid chest walls, which do not lend themselves to ordinary artificial respiration. In these

cases expiration can be assisted by pressure on the epigastrium.

Mouth to mouth insufflation is rather difficult to manage, and it is not easy to get up enough pressure, and the air has a tendency to pass into the stomach. I tried it once only in the case of a child, and found this inconvenience to a marked degree.

Of the various means of artificial respiration by expansion of the chest known under the names of Silvester, Marshall Hall, Howard, Kelly, and others, I prefer that known as Silvester's. For these reasons : it enables the largest amount of air to be introduced into the lungs ; it can be carried out with considerable compression of both sides of the chest ; the patient can be partially inverted at the same time ; it does not entail moving the body, and it is easily managed by one individual. During these proceedings it is of paramount importance to keep the upper air-passages clear; to do this I have found, as Dr. Bowles has demonstrated, that it is better to keep the mouth only slightly open, and push the whole jaw forwards while the neck is kept fully extended, rather than to pull the tongue far out with the mouth wide open. It is also important to have no strain on the front of the chest ; to avoid this the head should not be allowed to hang over the end of the table, as the weight of it dragging on the chest with the tension of the abdominal muscles has a tendency to fix the front of the thorax and hamper its expansion. To prevent this the head should be supported on its vertex to take the weight off the chest, and the pelvis raised to relax the abdominal muscles.

Faradisation of the phrenic nerves, when properly applied by placing the poles of the battery over the nerves behind each sterno-mastoid muscle, causes a contraction of the diaphragm and effective inspiration. It is indicated where the chest is rigid, as in old subjects and Silvester's method inefficient, but should always be employed in conjunction with pressure over the ribs, or where these are not compressible, with pressure in an upward direction over the epigastrium. In the cases in which it has been useful it has been combined with compression of the chest wall, without which it does not fulfil all the objects for which artificial respiration is performed. In one instance in my own experience in the case of an old man Silvester's method had no influence on

his chest at all ; but efficient artificial respiration was maintained by faradism with good results. In anæsthetic emergencies faradisation is only useful as a means of performing artificial respiration.

Tracheotomy as an adjunct to artificial respiration can very seldom be required, except to overcome some very definite obstruction, such as spasm of the glottis or impaction of a foreign body.

If air cannot be got into the lungs in ordinary cases without a tracheal opening it will be equally impossible with one.

In this connection I have one case of interest. A child æt. 3 years had chloroform administered by a house surgeon ; respiration and pulse suddenly ceased, and I, called from an adjoining room, saw it almost immediately. Its face was slightly livid, pupils dilated, pulse and respiration absent ; the tongue was already drawn out with forceps ; artificial respiration was performed by forcibly compressing the ribs, but no air entered. The throat was cleared, jaw pulled forwards without any benefit. I tried mouth to mouth inflation without other effect than inflating the stomach ; tracheotomy was quickly performed, and I sucked the opening vigorously to clear the trachea, and found it practically empty. Artificial respiration and inflation still failed to fill the lungs, but it was persevered with, and after some minutes, without any apparent cause, artificial respiration became effective, and air began to pass in and out of the lungs so freely as to blow out a lighted match with each compression of the ribs ; but the patient was then evidently dead.

A very similar condition of affairs was present in a fatal chloroform accident in a girl aged 14 years, which I reported in the 'Lancet' as a death from shock during anæsthesia.

In these cases it would seem that there is some spasm of the intrinsic muscles of the lungs, analogous to what occurs in asthma, which prevents the entrance of air. It is possible that under such circumstances nitrite of amyl might be of some use.

5. A fall in the blood-pressure due to depression of the vaso-motor centre is a regular feature of nearly all anæsthetic emergencies. When this happens, a large mass of the blood is withdrawn from the general circulation, and the patient, in the words of Professor Wood, " is bled into his

own vessels as effectively as into a bowl." From the symptoms in some patients, it seems probable that this vaso-motor paralysis may be the primary lesion, and that the other centres subsequently fail from simple anæmia ; in other cases the effects of vaso-motor paralysis are aggravated by paralysis of the heart.

Under such circumstances the immediate treatment is directed to the adoption of some dependent position of the head which will allow the blood to gravitate to it. This is facilitated by the physical effects of the vaso-motor paralysis, which practically converts the blood-vessels into a system of inert tubes, the contents of which are influenced only by the law of gravity.

The advantageous results of inversion are beyond dispute ; the debatable points are the effect this has on the heart, the degree of inversion to be employed, and the length of time the body should be kept in the one position without change.

Dr. Leonard Hill has shown how inversion or pressure on the abdomen distends and paralyses a chloroform-enfeebled heart. His suggestion seems excellent that partial inversion with artificial respiration should be first tried ; and if it does not produce immediate results, temporary adoption of the vertical position to empty the distended heart be followed by resumption of the horizontal or inverted position ; by this means a degree of circulation may be kept up. These manœuvres are of course difficult to perform with any degree of smartness with a heavy adult ; in the laboratory their constant results no doubt depend upon the perfect way in which they can be carried out. It must not be forgotten that the vertical position while it empties the heart also empties the head of blood, and it must not be maintained long.

As to the degree of inversion, I think complete inversion by suspension by the legs can be rarely required, as very little blood is necessary to keep alive the nerve centres. It is well enough in cases of very severe hæmorrhage, but in chloroform cases placing the body in a gentle incline should be sufficient. In no case should the head be kept dependent for long without change, as this causes stagnation of blood ; by raising it, or in a temporary resumption of the horizontal position, there is a chance of the blood being changed a little. Trendelenburg's position throughout an operation is an advantage in very feeble subjects, but it has

the disadvantage that the effects of the position may mask the onset of the failure of the circulation until it is too far advanced for recovery. In addition, according to Dr. Hill's experiments, a feeble heart will be hampered by it.

Transfusion to restore the blood-pressure by filling up the vessels has many drawbacks. A very large quantity of fluid is required to be of any use in raising the pressure, and the time necessary to get things ready is considerable. Indeed, to raise the blood-pressure in vaso-motor paralysis by pouring fluid into the vessels seems an impossible task, and one of which I have had no experience.

Pressure on the abdomen is indicated in cases of pure vaso-motor paralysis, the object being to drive the blood from the abdominal vessels. I think symptoms of anæmia of the respiratory centre, such as accelerated respirations or anæmic convulsions occurring in an early stage of the anæsthesia, with a quick-running pulse, point to the lesion being a vaso motor paralysis.

Copious warm rectal injections have been recommended in view of the absorption of the fluid by the rectal veins, and possibly with the intention of causing an expulsive effort, the influence of which was referred to in dealing with dilatation of the sphincter ani. It is difficult to see how either of these can be of much avail where an immediate effect is desired, though when given early they are probably of value in minor degrees of gradual collapse, especially where there has been actual hæmorrhage. As these injections can be administered without interfering with other treatment they should no doubt be tried.

Artificial respiration as a means of restoring the blood-pressure is of the greatest value, as it has been shown capable of keeping up a small amount of pressure even after death, and associated with the dependent position is our only reasonable line of treatment.

6. As regards subcutaneous injections of drugs, it has always seemed to me that in the actual crisis of the case the state of the circulation must be too feeble for them to have any chance of being of immediate use. I have seen no cases in which their employment was at all likely to do any good. When we come to consider them, we find that in most instances our exact knowledge of their action is obtained from experiments in which the drug is injected into the veins of an animal, the circu-

lation of which is presumably active. This is a different condition from what obtains in failure of the circulation in "an anæsthetic emergency," and deductions from one cannot be applied absolutely to the other. Comparing the conditions of the circulation in chloroform collapse with those found in shock, we find there is a remarkable similarity. There is the same vascular dilatation, fall in blood-pressure, anæmia of the superficial parts, and possibly the same arrest of vascular exchanges. These conditions of the vascular system produced by shock, according to M. Roger, militate against the absorption of injections of strychnine, making them ineffective. This being true, the same must equally hold good with an equivalent condition produced by chloroform, and will perhaps explain the absence of effect from large doses of strychnine.

The place of subcutaneous remedies in the course of treatment, if it exists at all, is at an early stage of the failure, or at a late stage of recovery when there is a sufficiently active circulation to convey them to the various organs.

I understand they are occasionally employed in chloroform accidents, but I have not heard of any case in which they were really beneficial. Their administration must be attended with some risk, as a dose large enough to have effect with a feeble circulation would surely become dangerous when the circulation became more active, and the effects of the anæsthetic had passed off.

The drugs recommended are digitalis, strychnine, atropine hydrocyanic acid, ether, nitrite of amyl by inhalation, of none of which have I had any experience. I shall, therefore, not trouble you by retailing information about them obtained from sources with which you are familiar. Of subcutaneous injections of ether in chloroform difficulties I have had some trifling experience, but am not satisfied that it is of any use.

This, gentlemen, completes my short and imperfect survey of the chief methods of resuscitation in anæsthetic emergencies. Of all these different methods the only ones of any real use are the partial inversion of the body with artificial respiration, varied, if need be, with temporary adoption of the vertical position ; if these do not quickly restore the patient, nothing else will.

DEMONSTRATION OF CASES

At the Monthly Meeting of the North-West London Clinical Society, November 17th, 1897.

Dr. MILSON in the Chair.

A Therapeutic Note on the Treatment of Subinvolution of the Uterus.

By John A. Shaw-Mackenzie, M.D.Lond.

Subinvolution of the uterus after abortion, miscarriage, and delivery is so commonly met with, and is the initial factor in prolapse and retroflexion of the uterus, as also chronic inflammation of the endometrium, ovaries, and tubes with their attendant invalidism in later life, that he ventured to submit for consideration the treatment of such condition by mercury and iodide, as opposed to ergot.

The history almost always dates from previous conception, and usually is that abortion or delivery has taken place within a few weeks or months, that bleeding and discharge have continued notwithstanding large doses of ergot and strychnia, and that curetting has been advised.

In all such cases the uterus is found to be enlarged and tender, the cervix œdematous, with patulous os. The patient is obviously out of health, and there is much blood-stained leucorrhœal discharge.

In one patient, who was recently sent to the North-West London Hospital for curetting, after every therapeutic measure had been tried, the bleeding stopped almost at once on the employment of drachm doses of the Liquor Hyd. Perchlor. and ten grains of iodide of potassium three times a day in a tumbler-full of water. In four others the bleeding had entirely stopped when they came the following week.

His experience was not limited to these cases, nor in respect to the cessation of bleeding alone, for on continued mercurial treatment he had constantly witnessed improvement of general health, and diminution in size of the enlarged uterus or ovaries, with amelioration of leucorrhœa.

He was well aware that many will differ as to the explanation. Personally he considered syphilitic sequelæ affecting the pelvic organs extremely common among parous women, and subinvolution one of the common manifestations.

The late Dr. Matthews Duncan was in the habit of prescribing mercury and iodide freely in the pelvic diseases of women, but he was not aware that such had hitherto been recommended as routine treatment in the very common condition of subinvolution of the uterus.

He thought it well to say that the above mixture cannot be tolerated for long in consequence of the headache it produces. Having arrested the bleeding, the iodide may be reduced to one or two grain doses, or omitted. He further preferred to continue treatment by the external methods of administration of mercury when possible. He had found a simple method of introducing mercury into the system is by vaginal pessary of five grains of Ung. Hydrarg. with twenty or thirty grains of cacao, this should be done by the patient nightly, or night and morning, until the gums are touched, which is very soon the case. He thought women are more susceptible to mercury than men, especially after abortion or delivery. He ventured to hope this note may prove to be of prophylactic use in the treatment of some chronic pelvic conditions in women.

Thymol in the Treatment of the Fever of Tuberculosis.—E. De Renzi ('Med. Week,' September 10th, 1897) finds that thymol is a valuable remedy in the treatment of this often obstinate and troublesome symptom. He finds it to be of distinctly greater value than quinine, antipyrin, acetanilid, and sodium salicylate, as unlike these the thymol has no depressing effect. It is administered in four-grain doses in the form of a powder enveloped in a wafer. These may be given three or four times a day, and gradually increased in frequency until sixty or seventy grains are given each day. He finds that tuberculous patients are very tolerant of large doses of thymol, and that it is well borne by the stomach, it seeming to favour digestion.—*Medicine.*

Buckskin Dressing for Eczema.—Davesac has found that buckskin applied over the salve fits smoothly to the surface, yielding to every movement, never rots nor produces erythema, does not absorb the salve and does not stick to the tissues, while it is easily washed and keeps the dressing moist inside and dry without, and the scabs leave a healthy surface when they drop off.
Semaine Méd., December 22nd.

SOME EFFECTS OF CANNABIS INDICA IN LARGE DOSES.

By R. C. BICKNELL, M.D.

THAT cannabis indica as encountered commercially is extremely variable in activity is a matter of common knowledge. This applies alike to the crude drug and to all preparations made from it. It is also generally understood, I believe, that the effects arising from the ingestion of even large doses of a potent preparation are likely to be alarming rather than dangerous, and that no case of poisoning which resulted fatally has as yet been recorded. A temporary neglect of the facts of the former statement, as a consequence chiefly of a realisation of the truth of the latter, resulted in my passing through a series of experiences the sensations of which I wish to record, as embodying some features of the drug's effects not generally described, and as going farther than such recorded experiences have hitherto been carried.

I had noted with interest the account of Dr. H. C. Wood's experiences as given in his work on 'Therapeutics.' The preparation which he had taken was made, I believe, from the American variety of cannabis. I had taken previously an extract made by an American house, gradually increasing the dose until five grains had been taken with scarcely perceptible effect, and recall giving within the space of three hours fifteen grains to a boy of seventeen with only slight drowsiness resulting. Wishing to avoid the tedious increase from one-eighth grain up, as in the previous case, I took at once three grains of an English extract. This preparation was quite soft, of a handsome green colour, taken from a freshly opened ounce jar, and was put into a gelatine capsule. The capsule was swallowed at 5 p.m. No effect was noticed until nearly three-quarters of an hour had passed, when a slight frontal headache was felt, dull in character and lasting only a few minutes. At 5.45 I was writing, when at the end of a sentence the right hand was suddenly jerked upward, slightly impairing the symmetry of the writing. A slight haze now became perceptible about the margins of the field of vision; the pulse was noticed to be somewhat accelerated, full, and strong. On being spoken to there was a perceptible interval before complete comprehension

of the words, the mind seeming to halt a little time before acting. Answering speech was also slow, and after a short time was somewhat confused, not greatly so, but words would become transposed in a sentence, requiring two or three trials to get them in their proper places. The haze gradually grew centrewards, until by 6 p.m. only the object looked at could be seen, all the surrounding field being dark as by a shadow from the circumference. Looking at my hands, the fingers seemed enormously long and quite large, and were moved with perceptible effort — the movement following an interval, and with a jerk, as if the impulse was delayed in transmission and reached the extremity all at once, not gradually as is usual.

With the beginning of the impairment of vision the muscles at the back of the neck began to be painfully contracted, the contraction beginning with those attached to the occiput, gradually extending downward, and including the muscles of the back until marked opisthotonos resulted. This contraction was tonic, and relaxed only when violent friction was applied over the affected muscles.

The pulse was now 100, temperature normal, the respiration slightly hurried, though this may have been owing to some nervousness which now became manifest. There was a sense of extreme tension all along the spinal column.

There were no visions up to this time, and no pleasurable sensations whatever were experienced throughout. At this time I began to have an impression of duality. I was fully aware that I was going through this experience, yet could not rid myself of the impression that I was witnessing it in another. Gradually I got farther away from reality, occurrences being given an interpretation quite foreign to their actual significance. For a long time I could bring myself back to a full realisation of everything by an effort of will, a stronger effort being required each time, until finally occurrences—all except the most pronounced impressions—were wholly lost sight of. Until after 6 p.m. walking was perfectly steady, and anything directly looked at could be seen, though near objects seemed quite far away. The sense of the duration of time also became altered ; a minute seemed as long as an hour almost, and the passing of the minute hand of the clock from

one figure to another seemed to require an interminable time.

At 6.15 I lay down, and surrounding objects and subsequent sounds became merely a part of a confused series of visions, many quite vivid for the time, but disconnected and too numerous to describe. I recall that at one time I saw the earth free in space, and comprehended all the laws which maintained its position in the universe with its numerous relations to other bodies, and perceived the result of every act, however trivial, even to the ultimate end of time. Every result, direct and indirect, was perfectly clear with but slight mental effort. Mixed with these ideas were other impressions ; views of the room in which I was, and of the people about me, and trains of thought doubtless started by occurrences which I did not notice. Much of the imagery was quite fantastic, though the sensations were rather of a painful and disagreeable nature. I was aware of any violent movement or loud noise during the whole time. The teeth were firmly set, it being impossible to force liquids into the mouth, and frequently strong convulsive movements affected chiefly the upper extremities, occasionally involving all the muscles of the trunk.

I regained rational consciousness about 7 p.m., remaining drowsy and dazed for four hours longer, though I comprehended all that was passing during this time. At 11 p.m. I went to sleep, waking at 7 a.m. next morning, feeling none the worse for my night's experience.

Phenomena which I thought worthy of note were—the existence of muscular contractions, followed later by violent convulsive movements, due, evidently to action of the drug on the spinal cord. This was one of the most notable features of the whole experience, yet I do not see that such action is at all prominently mentioned in the various articles upon the subject which I have read. This effect was early manifested and was conspicuous throughout. Aside from the acceleration of the pulse-rate and a feeling of fulness in the artery at the wrist, there was just previous to the occurrence of unconsciousness a sense of extreme tension in the abdominal blood-vessels, they feeling distended almost to bursting. This endured for some time. I did not have the feeling of foreboding or fear of impending death, mentioned by Dr. Wood. At no time did I feel

fearful of fatal result. After some hours the urine was very much increased in quantity, apparently about double the usual amount being passed for the time between 6 and 11 p.m.; after that it was not noticed as being unusual. No constipation resulted. I thought at one time that the mouth was very dry, as if the secretion of saliva was arrested, but after I became conscious there seemed to be no alteration in this secretion.

These are my own sensations. A physician who saw me while I was unconscious says that my pulse was feeble and respiration shallow, so that he feared collapse. As he applied an electric battery and gave a few injections of ammonia and brandy I presume he really had this impression. Shortly after this I "came to" quite suddenly.

Therapeutic Gazette. January, 1898.

NOTES.

Hæmorrhage from the Normal Kidney.— Dr. G. Kemperer ('Deutsche med. Wochenschrift,' 1897, Nos. 9 and 10) says that it is shown by clinical observation and deduction that hæmorrhages may occur from an otherwise normal kidney as a result of or under nervous influences (as in hæmoptysis or hæmatemesis); also that experimentally irritation of the nerves in rabbits has several times resulted in the production of hæmorrhage from a healthy kidney. There are many records of cases in which on account of hæmorrhage a kidney has been removed by the surgeon, and the organ found not to be diseased. The author explains these cases as being the result of a vaso-constrictor paralysis. Six cases that came under his own observation he classifies as follows : (1) Two cases, hæmorrhages of but short duration resulting from over-exertion (bicycle exercise); prognosis very good. (2) Two cases of prolonged hæmaturia in hæmophilic subjects; the diagnosis was based on the family history and the fact that the patient had previous to this had other hæmorrhages. In such cases all operative interference, even cystoscopy, is contra-indicated. 3. Two cases of prolonged angioneurotic hæmaturia; thus diagnosticated because the bloody urine was a simple mixture of blood and urine, and did not show the presence of any other pathological elements, while palpation showed no

enlargement of the kidney. Treatment consists of rest in bed, milk diet, suggestion, the application of hydrotherapy, and perhaps electricity.

Medical Record, January 22nd, 1898.

Clinical Methods : a Guide to the Practical Study of Medicine. By Robert Hutchinson, M.D., F.R.C.P., and Harry Rainy, M.A., F.R C.P. Edin., F.R.S.E. London, Paris, and Melbourne: Cassell and Co., 1897. Crown 8vo, pp. 564, 137 illustrations and 8 coloured plates, 9s.

To every student when he first begins work in a medical ward the question presents itself, how shall I investigate this case ? To that question the authors have provided an answer by writing this volume, and, as they very truly point out, the title 'Clinical Methods' describes the scope of the book better than any other. The work is not intended as a treatise upon medical diagnosis, but it aims rather at describing those methods of clinical investigation by the proper application of which a correct diagnosis can alone be arrived at. The first chapter deals with the methods of case taking in general, and includes a scheme for investigating medical cases; this scheme is worked out in detail in the rest of the book, each system being taken up separately, and the manner of investigation fully detailed. Inasmuch as the clinical methods of examining children differ in many respects from those followed when examining adults, the authors have wisely devoted a special chapter to that subject. Clinical investigation has notably advanced within the last few years, and to those practitioners who are desirous of being thoroughly up to date this volume will prove valuable. It is a great pity that this really excellent publication should be marred by one or two avoidable printer's errors, otherwise nothing but praise can be given for the manner in which an immense amount of necessary information has been most cleverly arranged and scientifically treated. The book is illustrated with 137 diagrams and figures and 8 coloured plates, which contribute in no small way to the pleasure and profit derived from the study of this practical guide to clinical medicine. To whichever part of the book one turns the recent additions to medical knowledge have clearly made their influence felt, with the result that the popularity of the work is completely assured.

The True Interpretation to be placed upon the Medical Acts.

By VICTOR HORSLEY, F.R.S., &c.

THE history of the General Medical Council and of medical reform shows that for a number of years the shibboleth has been industriously repeated that the Medical Acts can do nothing to aid the practitioner who is so strictly bound by them, and that above all it is a great mistake to think that they in any way protect his means of livelihood. Those members of the General Medical Council who are most active in pressing forward this view have so far persuaded themselves and others that such is the case as to form a signal instance of the legal maxim that an *error if it is repeated often enough to become common sometimes passes current as law*, and in fact exemplifies what Chief Justice Denman called "law taken for granted" ('Broom's Maxims,' edited by Manisty and Cagney). Mr. Carter, for example, in his vain attempts to stem the tide of reform, which is now fortunately rising quickly, takes it for granted that the Acts afford no protection to his professional brethren, and not a few of those who have followed him have re-echoed the idea that the Medical Acts only protect a title, and do not protect a registered practitioner's personal privilege to practise medicine, surgery, and midwifery. This assumption by Mr. Carter is rather difficult to understand, because it is nowhere mentioned in the Acts, and for the very good reason that medical titles *per se* did not and do not require their protection. For example, if systematic attempts are made by unscrupulous persons to falsely represent themselves as graduates of a University, the University could protect its rights, and arrest the usurpation of its degrees.

Moreover the Acts of Parliament have never said what Mr. Carter and others take for granted they say. What they actually say respecting titles is that if anybody falsely uses a title *in order to make the public think* that he is registered under the Medical Act, then something will follow which we will discuss presently. Mr. Carter and others, who seem to have little interest in their colleagues preserving their paramount right whereby they are enabled to live, leave out the words in the clause, "implying that he is registered under this Act, or that he is recognised by law as a physician or surgeon, or a practitioner in medicine,

&c." It is a striking example of the perpetuation of "common error" that although the Act has been in existence for thirty-nine years, it should even now be necessary to, as it were, discover that **the right to practise medicine, surgery, and midwifery is a privilege conferred under the Medical Acts by registration, and that no one but a registered person possesses such a right.** The statute which confers this right on the registered practitioner is Section 6 of the Act of 1886, which is a modified version of the repealed Section 31 of the Act of 1858, and describes the possession of the right in question. The first sentence of Section 6, 1886, stands thus :

" EFFECT OF REGISTRATION.

" Privileges of Registered Persons." "6. On and after the appointed day a registered medical practitioner shall, save as in this Act mentioned, be entitled to practise medicine, surgery, and midwifery in the United Kingdom."

No unbiassed person can read this Section without recognising that it describes the conferring of a right or privilege upon registered persons, and in accordance with the legal maxim that *if anything is expressly asserted, the converse* * *is thereby excluded*, it follows that **a person who is not on the register does not possess the right to practise.**

It is interesting to amplify this a little further, because it is worth while, if one is considering the possession of a right, to see how the possession of it is regarded in the eyes of the law. The word *" entitle "* used in the Section of the Act is the active verb of the legal expression " title," which word " title " signifies the outward evidence of a right possessed by a person ; and Sir E. Coke has defined it thus : " Titulus est justa causa possidendi id quod nostrum est " (Wharton).

Our title, therefore, to our right to practise medicine, surgery, and midwifery is **Registration.**

This reading is so plain that it is difficult to understand why it should hitherto have been passed over, or how it can be for a moment suggested by the opponents of reform that the Act does not confer the right in question.

It is a favourite assertion of such persons that our right to practise is not a substantial right, because the section conferring it does not also contain within itself (*i. e.* among its phrases) the penal protection of that right. But the same

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* " Expressum facit cessare tacitum ; " or " expressio unius est exclusio alterius."

persons who argue in this way forget two things : they forget the proud boast of the English law, " Ubi jus ibi remedium ;" the meaning of which is not merely the literal translation, viz. " Where a right exists, there also is a remedy," but that every instrument of legislation which confers a right contains provision of right of action or means given by the law for the recovery or assertion of the right con- ferred (Broom's 'Selection of Legal Maxims,' edited by Manisty and Cagney). Neither has the law failed us in the case of the Medical Acts, for it has provided by Section 40 for the complete protection of **registration** as alone conveying the right to practise medicine, surgery, and midwifery.

Anybody, therefore, who exercises the privilege of practising without being registered, violates the Acts and comes under the penal Section 40, which thus provides for the punishment of unqualified, that is unregistered persons, who are encouraged by Mr. Carter's statements to usurp the privilege of medical practice.

Neither is the protection of our right exhausted if any magistrate failed to convict an unregistered person under our special " remedium," namely, Section 40 ; for it is also a recognised principle (Broom's Com.) that whenever the common law imposes a duty or provides a privilege, and no other " remedium " can be shown to be equal to arresting an infringement of that duty or privilege, the Court of Queen's Bench will interfere by a mandamus.

I desire next to draw the attention of the profession to the fact that the paragraph relating to unregistered and unqualified practitioners, on page 13 of the legal preface to the Medical Directory, which preface is entitled Abstract of the Principal Laws affecting the Medical Profession, is misleading, wherein it states that "registration is not compulsory upon medical men, nor can any penalties be inflicted upon an unregistered person, who, having obtained a qualification in medicine or surgery, practises according to such qualification; . . . there is nothing, therefore, to prevent a qualified but unregistered person from keeping an open surgery, and doing a ready-money business. A person who practises medicine or surgery* without having obtained the necessary diploma or licence is, of course, debarred from recovering any fees or charges. He may, moreover, be proceeded against for penalties by any of the medical or surgical corporate bodies whose jurisdiction he may infringe."

Taking the first of these dogmatic and, as I think, erroneous statements,

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* This sentence is an example of how little care or attention is given to medical matters, since though it is nearly twelve years since the triple qualification in " medicine, surgery, and midwifery " was established by the Act of 1886, the Directory continues year after year to use the old expression " medicine or surgery " as established by the Act of 1858.

although there is not a section in the Acts stating in so many words that every medical man must register himself (and such a section, be it noted, would have been quite redundant), I contend that the able writer of the preface is not justified in saying that " registration is not compulsory upon medical men." That they feel it to be compulsory is shown by the fact that they take good care to register, and they fight hard to keep their names on the Register; but if that is not regarded as sufficient evidence of obligation, I submit that it logically follows from what has just been said, that since anybody practising without being registered is liable to prosecution, and since there is no provision in the Act for the protection of persons who may have passed the necessary qualification examination for registration but who do not register, the Act contains within itself everything that makes registration compulsory. The Act makes such prosecution easy, for it expressly states that a copy of the Medical Register* showing that the name of a person is not contained therein is sufficient evidence in a court of law to prove absence of registration on the part of that person. If that omission is proved, then by Section 34, 1858, and Section 6, 1886, the unregistered person stands convicted of inability to practise his profession and enjoy the rights appertaining to a qualified, *i. e.* registered practitioner. Surely this is compulsion to register.

Passing from this point one proceeds next to the further statement in the excerpt from the directory just given, wherein it is alleged that " no penalties can be inflicted upon an unregistered person who had obtained qualification, and who practised according to such qualification, and that there is nothing to prevent a qualified but unregistered person from keeping an open surgery," &c. Here another common error is involved in this statement, which, to use the expression I began the article with, is a further example of " law taken for granted." The error is that a " qualification " is to all intents and purposes a statutory licence to practise. This is the old and defunct view of a qualification. It seems to be entirely overlooked that the character of a medical diploma, as carrying with it licence or liberty to practise, was destroyed by the Medical Acts of 1858 and 1886, and that registration was instituted by those Acts to override the nominal value of that statutory acknowledgment of a candidate having passed a test examination which he calls his diploma, and to which it is now sought by some to attach imaginary powers and impossible virtues. The Act of 1858, for example (Section 15), says that any person who possesses one or more of the qualifications mentioned in the Schedule (which said Schedule simply contains a list of the Medical Diplomas extant in 1858) shall be " entitled to be registered," no mention, be it observed, being made of the qualification entitling its owner to practise at all. So, too,

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* Of course where registration has been effected subsequently to the last issue of the printed Register, a certified copy of the MS. Register is accepted (Section 27, Medical Act, 1858).

Section 3 of the Act of 1886 runs thus:—" A qualifying examination shall be an examination in medicine, surgery, and midwifery, held for the purpose of granting a diploma or diplomas *conferring the right of registration;* " here again no mention is made of conferring any right to practise, because such is confined to a **registered person** and is his sole right and privilege.

A **"qualification," therefore, at the present time is useless without registration.** I am glad to have recently succeeded in eliciting from Mr. Upton, the Solicitor and Clerk to the Apothecaries' Society, his unqualified confirmation of this my contention ('Lancet,' January 22nd, 1898), and I hope that the position will shortly be universally recognised.

A concluding consideration in this matter is the other privilege conferred upon the profession by Section 6 of the Act of 1886; namely, the right (the right of registered persons alone) to recover charges for professional service by process of law. Whereas the possession of the right to practise is now being actively discussed, no one contests the possession of this second privilege, and yet what applies to one is obviously true of the other. My opponents, therefore, who regard the words "entitled to practise" as having no meaning are inconsistent as well as inaccurate. A few have endeavoured to evade this position by pointing to Section 32 of the Medical Act, in which it is stated that no persons except those registered shall be able to recover charges in a court of law; in other words, their contention is that the second privilege granted by Section 6 of the Medical Act of 1886 is specially guarded by Section 32 of the Act of 1858, and that the first privilege of Section 6 of the Act of 1886 is not so guarded. That this, however, is a wholly mistaken view is obvious, since I have already shown that the first privilege (of Section 6, 1886) is specially guarded by Section 40 of the Act of 1858. Each privilege, therefore, has its own guarding section. Of necessity such controlling or guarding provisions were placed in widely separated sections, because they have nothing in common. Section 32 merely states the negative of the (second) right, and for obvious reasons does not provide any penalty against a person who merely attempts to sue for non-legal charges. As a contrast, necessarily the first privilege, the fundamental one involving the capability of professional practice, could not be simply dealt with in a similar way, and was therefore treated by the special Section 40 involving penal consequences on any person infringing the right and so violating the law.

In putting forward the above reading of the Medical Acts as the real and only true interpretation which should be placed upon them, I am perfectly aware of the responsibility I have undertaken. If the courts should not confirm the validity of

the foregoing views, then such adverse decision can only add force to the other reasons which exist for obtaining amendments to the Medical Act, because no one will deny that as a matter of equity and justice the members of the medical profession who are compelled by law, first, to pursue a very long and expensive course of education, secondly, to place themselves under the disciplinary clauses of the Medical Acts, and thirdly, by virtue of their registration to render themselves liable to severe legal responsibilities in case they fail in their duty at any time, should have the same meed of protection in the exercise of their calling as the members of the sister profession of the law enjoy in the fullest degree.

<div align="right">YICTOR HORSLEY.</div>

THE CLINICAL JOURNAL.

CONTENTS.

NOTICE.

ON THE TREATMENT OF UTERINE MYOMATA (FIBROIDS).

BY

J. BLAND SUTTON.

LECTURE II.—THE MODES IN WHICH UTERINE
MYOMATA IMPERIL LIFE.

IT is too true that myomata are the commonest of
all the species of tumours to which women, whether
married, single, fruitful or barren, are liable. It
is also a fact that the uterus may contain one
myoma or many, and cause neither inconvenience
nor suffering,—indeed, the individual owning them
is ignorant of the existence of a tumour in her
womb ; but it is equally true that uterine myomata
are often the source of much suffering, and occa-
sionally cause death in insidious ways, some of
which will be considered in this lecture. It will,
however, be useful to briefly sketch the life history
of a harmless myoma of the uterus.

Myomata arise in the uterus during the men-
strual period of a woman's life. Their occurrence
before puberty is unknown, and they are rarely
recognised before the twenty-fifth year. Between
the years 1888 and 1892 I made a careful exami-
nation of many pathological museums, and failed
to find a specimen of uterine myoma observed
before the twenty-fifth year. However, a few
cases have been recorded. An example in a
woman of twenty-three years has since come
under my notice, and will be described in the
next lecture. After the twenty-fifth year they
increase in frequency, which attains its maximum
between the thirty-fifth and forty-fifth years. In
many, very many sterile women the tumours, if
their environment be favourable, cause no trouble,
especially when they grow slowly ; on the approach
of the menopause, as a rule, they cease to grow
and slowly calcify. It is stated by many writers
that uterine myomata shrink and even disappear
after the menopause, but the evidence on this
matter is not of a satisfactory character.

It is well to bear in mind that occasionally a

myoma growing slowly before the menopause will suddenly increase rapidly after this event. The inconveniences and perils which are associated with many myomata depend very largely on their environment; indeed, there is no organ in which the baleful effects of environment of innocent tumours can be studied in so many aspects as in the uterus.

1. *Hæmorrhage.*—This is the commonest of all the inconveniences which myomata cause, but it is confined to those which implicate the endometrium. The bleeding occurs under two conditions; most commonly it takes the form of excessive loss at the normal menstrual periods (menorrhagia). The most serious hæmorrhages are associated with septic myomata. It is a fact of some importance that a small submucous

It contained two myomata; the capsule of one had ulcerated, and the tumour, septic (gangrenous) and stinking, was the source of the bleeding.

Septic Infection.—This is, perhaps, the most serious complication of a myoma, and even when it does not cause death is always attended with dangerous consequences. Infection of a myoma may arise in a variety of ways,—*e. g.* the extrusion of a submucous myoma into the vagina exposes it to injury, and micro-organisms gain access to the tumour through abrasions in its capsule. Infection may be due to injury from the uterine sound or dirty dilators, or septic changes supervening on labour or miscarriage; occasionally it is due to intestinal gases when bowel adheres to the tumour, and it sometimes follows oöphorectomy. An infected myoma is a soft, dark-coloured, stinking
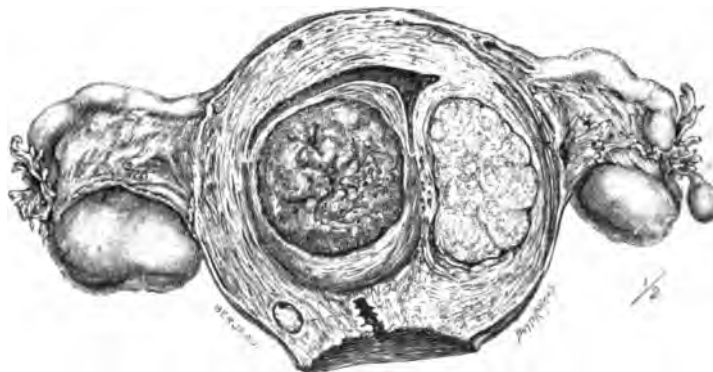
Fig. 1.—The body of the uterus containing two sessile myomata, one of which was gangrenous and the source of alarming bleeding. From a woman 40 years of age, mother of three children.

myoma will induce such profuse bleedings at the menstrual period as to place life in imminent peril, whilst a large interstitial myoma, even though it project into the uterine cavity, scarcely influences the loss.

When a woman with a myoma bleeds excessively between, as well as at the normal menstrual periods, it often indicates that the tumour has become septic, and this explains the almost continuous bleeding associated with a partially extruded and septic polypus. For example, the fundus of the uterus (Fig. 1) was removed from a woman of forty years, on account of such severe bleeding that it was thought she had uterine cancer. She could not walk because she bled, and digital examination of the uterus caused a rush of bright arterial blood. On dilatation a soft sessile tumour was made out, and after consultation the uterus was removed.

mass, which bleeds freely when touched. In the early stages of the infection it appears on section œdematous, and exhales a sickly odour. On microscopic examination the muscle cells are separated by multitudes of inflammatory cells, and colonies of pathogenic micro-organisms can by special methods be demonstrated among the inflammatory cells.

When a large myoma becomes septic it gives rise to severe constitutional disturbance (septicæmia), like gangrene of other organs, and will, unless promptly removed, inevitably destroy life.

Small myomata when septic, though they give rise to serious trouble, do not so urgently threaten life, but they work great mischief, for the infection extends from the tumour to the adjacent endometrium, and in due course involves the tubal mucous membrane, which in mild cases ultimately

leads to occlusion of the cœlomic (abdominal) ostium of one or both tubes, an event which is occasionally followed by pyosalpinx. In very acute (fulminating) cases the septic material infects the peritoneum, often fatally. Occluded, distended, and pus-containing tubes are not infrequent concomitants of a small troublesome submucous myoma.

This is a complication of uterine myomata which has not received the full attention it deserves. I have met with it in several cases, in which there was reason to believe that the pain and suffering which induced the patients to seek relief and submit to operation were caused by the occluded and distended Fallopian tubes. It is possible that the occlusion of the cœlomic (abdominal) ostia of the tubes is in a few instances responsible for the barrenness of the patients.

Malignancy.—It is currently believed that a sarcomatous change may supervene in uterine myomata. The matter has been considered very carefully by competent writers. A critical examination of the evidence makes it clear that a very large proportion of cases, described as "sarcomatous degeneration of a fibroid," were examples of infected myomata. In all future records, if they are published as evidence in this direction, they will need to be sustained by the report of a microscopic examination conducted by a competent pathologist.

It is very difficult to deny that a sarcoma may not arise in a myoma, for in one case nodules were found in the right lung, wall of the cardiac ventricle, and right kidney. These furnished the microscopic features of a myoma, and the subject, a woman of fifty-nine, had a large myoma in the uterus. This case was reported by Dr. Findlay, and I made the *post-mortem* examination at the Middlesex Hospital.

The great defect in the history of nearly all the cases of so-called sarcomatous degeneration of uterine myomata is the absence of the complete history of the cases; sarcomata are so prone to give rise to secondary deposits that any case which had run its natural course to a fatal issue would be expected to yield secondary nodules in the lung at least. Nothing would be more convincing to those who are sceptic.

When carcinoma of the cervix arises in a uterus containing a myoma (and this is by no means a rare combination) the tumour remains unaffected

until its capsule is eroded, then the myoma ulcerates and sloughs with great rapidity.

Impaction and its Effects.—A uterine myoma is said to be impacted (or incarcerated) when it fits the true pelvis so tightly that the tumour cannot rise upwards into the belly. All varieties of myomata may become impacted, and as the complication is of great clinical importance, it needs detailed consideration.

A subserous myoma growing from the fundus will often produce retroversion of the uterus, and the tumour occupies the hollow of the sacrum. As the myoma grows it appropriates the available pelvic space, and in due course exerts pressure on the rectum and urethra, interfering with defæcation and micturition.

A solitary intra-mural myoma may be small enough to rest in the true pelvis without pressing unduly on the urethra or ureters. Presently it increases to such a point that the turgescence which precedes the menstrual flow will cause it to press the urethra against the symphysis, and cause retention of urine. When menstruation occurs the turgidity of the tumour subsides, and the urethra is set free. Frequent recurrence of this pressure permanently damages the bladder and kidneys. Very vascular myomata yield a loud murmur or hum on auscultation, a sign of very great value in differential diagnosis. In many cases I have been able to demonstrate the existence of a loud murmur for a few days before menstruation, but it disappeared with the flow of blood, and remained in abeyance until a few days before the succeeding period.

The most insidious and therefore the most dangerous variety of impaction is that complicating cervical myomata. It has already been mentioned that when a cervix-myoma attains an average transverse diameter of 10 cm. (4 inches) it has practically used up the spare pelvic space, and necessarily exerts injurious pressure on rectum or bladder. Most commonly it presses on the neck of the bladder and causes retention, leading to frequent and painful micturition, causing the patient to seek advice, and this leads to the detection of the tumour. It is one of the most striking features of the cervical myomata that they do not cause bleeding except when they extrude from the mouth of the uterus and become infected, and rarely cause inconvenience until they interfere

with the bladder. Herein lies the danger, as grave injury is often wrought on the pelvis of one or both kidneys before the existence of the tumour is even so much as suspected. It is an important fact to remember that *when a woman between thirty-five and forty-five seeks relief because she suffers from retention of urine for a few days preceding each menstrual period, it is almost a certainty that she has a myoma in her uterus.*

Axial rotation.—A subserous myoma with a long and slender stalk is liable to rotate and twist its pedicle, a movement which causes very great pain. Some small calcified pedunculated myomata may be so twisted that they become de-

the tumour. At the operation a myoma was found weighing 5 kilogrammes, but with a stalk thinner than a lady's little finger, composed mainly of channels resembling hepatic veins. It was easily demonstrable that the variations in volume of the tumour were due to torsion of this pedicle, which, when the size of the myoma is taken into account, can only be regarded as extraordinarily thin.

On one occasion I performed abdominal myomectomy for the relief of pain, and found a pedunculated subserous myoma the size of a bantam's egg, which had so twisted its pedicle that exactly one half the myoma had necrosed

Fig. 2.—Sagittal section of a pelvis with the uterus in position, showing an impacted myoma. From a woman who died after oöphorectomy: there were septic changes in the tumour.

tached. A loose myoma of this kind has been found in the sac of an inguinal hernia.

Although it is unusual to meet with subserous myomata possessing stalks so slender as to render axial rotation a factor of clinical importance, it is nevertheless an event to bear in mind in estimating the value of pain in diagnosis. For example, the tumour depicted in Fig. 3 I removed from a patient under the impression that she had an enlarged and wandering spleen. The tumour exhibited marked alterations in volume; increase of size and aggravation of pain seemed to indicate 'al rotation, and impeded venous circulation in

and become adherent to the adjacent surface of the sigmoid flexure of the colon.

Intestinal obstruction.—Uterine myomata may obstruct the intestines in three ways; thus—

A pedunculated subserous myoma, especially if its stalk be long and narrow, may entangle a loop of small intestine and lead to fatal obstruction. This may happen with small as well as with large tumours. On one occasion I successfully operated on a single lady thirty-four years of age, and freed a coil of ileum which had become entangled round the pedicle of a stalked subserous myoma growing from the fundus of the uterus.

A very large myoma rising high in the abdomen may rest upon the pelvic brim in such a way as to obstruct the sigmoid flexure.

Lastly, an impacted myoma may press upon the rectum and lead to obstinate constipation and chronic obstruction, with all its inconveniences and evils.

In a very exceptional case, recorded by James M. Arnott in 1840, a maiden lady seventy-two years of age was knocked down by a large dog and fell

lecture by enumerating certain conditions of the uterus and its so-called appendages which may co-exist with myomata and lead to errors of diagnosis. Indeed, some of these when existing independently of uterine myomata are very apt to be mistaken for them, even by the most experienced physicians and surgeons.

1. The co-existence of carcinoma of the endometrium, either of the cervix or the body of the uterus, and myomata has already been mentioned.
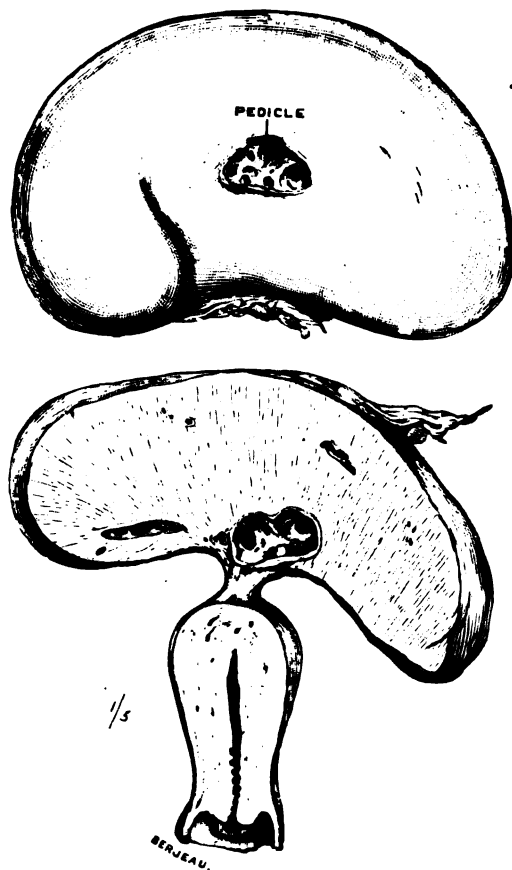
Fig. 3.—Subserous myoma with an unusually narrow and vascular stalk, which simulated a wandering spleen. The upper figure shows the spleen-like shape of the tumour; in the lower it is shown in section.

forward on the pavement. She was seized with severe pain in the belly, and died in thirty-four hours. At the autopsy a circular hole was found in the ileum, which lay between the anterior abdominal wall and a calcified uterine myoma as large as a child's head. The calcified tumour is preserved in the museum of the Middlesex Hospital. It is figured in my article on "Tumours" in 'Treves' Surgery,' vol. i, p. 465.

It may perhaps be useful to conclude this

2. Unilateral or bilateral pyosalpinx. 3. Ovarian tumours of all kinds, unilateral and bilateral. 4. Inversion of the uterus may be induced by a small submucous myoma. 5. Pregnancy often occurs in a myomatous uterus, and is so important a subject as to demand nearly the whole of the succeeding lecture for its consideration. 6. Even such a rare combination as tubal pregnancy and myomata have been carefully observed and recorded.

A CLINICAL LECTURE

Delivered at the Central London Sick Asylum,

By JOHN HOPKINS, F.R.C.S., etc.,

Medical Officer.

GENTLEMEN,—I propose to-day to show you cases which illustrate departure from the normal of the reflexes.

This child has heightened deep reflexes. On striking the patellar tendon you see there is a high knee-jerk. Not only that, but on striking the middle of the tibia the same jerk is produced. On pressing up the foot you observe the vibration known as ankle-clonus; the same is seen on the other side. By taking the limb in your hand you notice it is very mobile, and she has considerable voluntary power. Her ailment is paraplegia due to pressure, possibly to transverse myelitis, a consequence of caries.

Here is another little child in the same condition. There is heightened knee-jerk on striking the patellar tendons, also on striking the tibiæ, but there is no actual ankle-clonus. On examining the back the cause is evident—curvature of the spine. There has been marked rigidity in both cases, but, as a consequence of rest, this condition has disappeared, together with the clonus in the latter case.

The next patient I want to show you is a woman of middle age, who has very considerable difficulty in placing one leg before the other. Here, again, is high patellar reflex on both sides, producible also on striking the tibia. There is an ankle-clonus in the left leg, but not in the right. The left leg is very rigid too, but not the right. This patient has suffered from the condition for years: it is a slowly progressive lateral sclerosis causing spastic paraplegia.

The next case, also a woman of middle age, walks perfectly well. You will notice there is marked wrist-jerk on the right, but not on the left; and there is no rigidity. Cursory examination reveals no evidence of paralysis. She came here with right hemiplegia; the leg was barely affected, but the right arm was paralysed, and she was aphasic. She has completely recovered from her paralysis now, and can do most things; but the wrist-jerk is a relic of the affection, due to a de-generation passing down the pyramidal tract to the motor cells of the anterior column of the cord in relation to that arm.

The next patient, an elderly male, was observed on admission to have a slightly ataxic gait; and on examination he was found to have very high reflexes, though without ankle-clonus. The knee-jerks are now about normal. The muscles of the calf are very flaccid, a marked contrast with their condition in spastic paralysis. There was slight anæsthesia in the right foot, but that is better than it was. He has paralysis of both bladder and bowel. Before he took to his bed he had a girdle sensation and pain in the right side. Thus we have here a case of paraplegia affecting mainly the bladder and the rectum, originally causing a high reflex, which, however, subsequently became only normal, due to a transverse myelitis in the dorsal portion of the cord; and judging from the position of the initial loss of sensation, together with the high reflexes, caused by pressure directly on the postero-lateral cord of the right side. There is a history here of specific disease thirty years ago, so that probably the lesion is a gumma pressing on the cord. He is improving under iodide of potassium.

In our next patient, also a man past the prime of life, the patellar reflexes are equal but not excessive. There is slight tendency to clonus on the right side, and there is clonus on the left. He has considerable voluntary power, and has not lost control over his bladder or rectum. That is a paraplegia with obvious signs of pressure, as evidenced by the spastic condition, due, as you see, to senile caries producing pressure, if not transverse myelitis.

The case of this middle-aged man is similar to that of the woman you saw just now who had only wrist-jerk. He had hemiplegia from which he has made a practically complete recovery, the wrist-jerk being the only remaining symptom.

Now, to come to the subject of to-day, I propose first of all to make a cursory examination of the views that are at the present time held respecting nerve structures in general. The neuron is the basis of nerve structure, and is a bipolar cell in its simplest form. But one or other of those poles may vary considerably. One pole may be given off close to the other, or at points opposite each other in the cell; they may even be given

off together. In the latter case you have a cell with one pole which splits into two. That is the condition of the neuron of the spinal ganglion of the posterior root. These branches or poles of the cell constitute the nerve-fibres. When the fibre which goes to the periphery arrives there, it divides into numerous branches. The other fibre ascends into the spinal cord and divides into numerous branches also. Each branch is tufted at its end, producing numerous small branches or twigs, which come into relation with the corresponding tuft of twigs from another neuron of the spinal cord. I can illustrate this by extending the fingers of both hands, and placing the tips of the fingers of one hand in contact with those of the other. The whole nervous system is composed of these neurons, the shapes of the neurons differing considerably; but all neurons maintain the fundamental characters, viz. bipolar cells. One of the poles may send out branches in several directions in the immediate neighbourhood of the cell, and indeed the branches may arise directly from different parts of it, but there is always one which proceeds away from the cell to a distant point, constituting nerve-fibre.

Now, what is the function of this neuron? The neuron of the ganglion of the posterior root being a unipolar cell with its branches going up and down, suggests that the body of the cell is not concerned in receiving or transmuting any nerve discharge, but that it is merely concerned in maintaining the nutrition of the fibre. That is the opinion which is now held. Hence all processes, from the simplest reflex up to the highest thought, take place in a succession of fibres communicating but not in actual continuity one with another. The body of the nerve cell is concerned not only in maintaining the nutrition of the fibre, but is probably concerned in furnishing the nerve-fibre with energy. Let us assume that the nerve-fibre is loaded with energy, which may be discharged by an appropriate and sufficient stimulus. If the stimulus be gentle, then the discharge is slight; if the stimulation be strong, there is a marked discharge. Thus, on gentle titillation you may get a simple movement, but on inflicting pain you may get an exaggerated one. It is asserted that these tufts of the branches of the neuron act as resistances to the discharge of

the energy. It needs a certain stimulus before the energy can pass these tufts, and if these tufts present different resistances, it would follow that on gentle stimulus the discharge would pass away by one or two tufts, but if the stimulus were strong it would pass along more. Thus the neuron may cause a simple movement, or may cause general movement throughout the body, according to the degree in which the stimulus has been diffused by these terminal branches. Taking for granted that each neuron is loaded with energy, the nervous system may be regarded as a reservoir of energy, or rather, a compound reservoir or system of reservoirs. Under appropriate and sufficient stimulus the whole energy of this reservoir may be discharged suddenly, as in the case of convulsions. In health the discharge of nerve energy takes place on ordinary lines, and the result is that we have proper and rational movements. If the discharge be excessive, we may have tremors or exaggerated movements without showing much purpose; or finally, if there be a morbid condition the discharge of energy may be such as to produce universal convulsions, examples of a general and disorderly overflow. We have assumed that there is in each neuron a certain quantity of nerve energy stored, which cannot escape until an appropriate stimulus is applied, because of the resistance which is offered to its escape by the terminals. When the energy is discharged from the neuron it is quickly replaced, but there comes a time when exhaustion arrives. By constant stimulation of one particular spot, the nervous energy becomes thoroughly exhausted, and it takes some time for the part to recover its functions. The neuron itself is mainly the generator of its contained energy; but it is not at all unlikely, indeed it is highly probable, that the energy that lies in all neurons is furnished to any one which has been exhausted, because certain neurons such as govern the respiration and the heart are constantly employed, and never have an opportunity of rest, while there are others that have long periods of rest. So it seems likely that those which are overworked, as it were, are furnished with energy from those which are at rest. Taking this into consideration, Dr. Charlton Bastian advanced the theory that the cerebellum was the specialised organ for the furnishing of this energy to supply the neurons which are always at work, and those which are

specially called upon to do extra work. But if this be the case, it does not follow that the other neurons throughout the cerebro-spinal system are not ready to furnish energy as well when necessary. One may suppose that all the neurons are ready to yield up their energy when called upon, but that the cerebellum is constructed to provide practically a continuous supply. Now, the rapidity with which energy is liberated from the neurons differs very much according to the conditions of age, health, &c. For instance, in youth, when the neurons are in perfect health and therefore rapidly recover their lost energy when at work, we have much more rapid production of energy than in old age. Possibly that is one of the reasons why, in children, convulsions are so often exhibited as the result of fever, or of peripheral irritations, which in adults do not usually cause convulsions at all. Then, again, this energy in debility is sometimes evidently produced quickly and released quickly ; for in these conditions we have an over-sensitiveness of the nervous system in which there is abnormal activity at the same time that there is considerable weakness, known as irritable weakness. This rapid generation of energy in the physically weak may be due to unstable protoplasm—unhealthy and weak protoplasm, which breaks down readily ; you may have a weak neuron producing an excessive quantity of nerve energy, causing great activity, but only for a short time, being soon exhausted. Then, again, this liberation of nerve energy may be possibly due to decreased resistance in the terminals. The neuron is dependent on the general condition for the maintenance of its health. If the blood be out of order, the neuron must suffer, and then the production of energy may suffer, either in being produced too quickly, or, through failure in the nutrition of the tufts, leading to decrease in their normal resistance, in being too readily released. The rapidity with which nerve energy may be discharged must differ very considerably. In, say, an epileptic fit, discharges occur at first so rapidly as to produce tonic convulsion, but as the neurons become exhausted there is clonic convulsion, presumably because the reservoir is constantly losing, and stands at a lower pressure, with the result that it supplies the parts concerned in the production of the convulsion more slowly. There are good reasons for regarding the cerebro-spinal system as

a reservoir of nerve energy, which energy may be supplied from one part to another, in any direction in which it is required, along the neurons. There is no reason to suppose that the neurons have any directive power whatever ; the only obstacle which stands in the way of the transmission of the energy from one point to another is the resistance at the terminals. There are cases which go a long way towards convincing one of the truth of this. In cases of transverse myelitis, when there is pressure upon the spinal cord, increased reflexes result : and as long as there is any bridge of grey or white matter joining the upper and lower portions of the cord at the point affected by this transverse myelitis, clonus is maintained. But directly that bridge is broken, all reflexes disappear. In a very interesting article in ' Brain,' Dr. Hering, of Prague, advances the theory that each individual neuron produces its own particular quality of energy ; so that in these cases of transverse myelitis, when there is only a little bridge of matter to transfer this energy, the peculiar energy of each nerve-fibre passes over this bridge, and finds its appropriate fibre again when it reaches the other side. However this may be, there is no question that as long as there is the slightest connection of nerve matter between the two portions of the cord, there is a transference of energy, which is diffused through the lower part of the cord, and passes by way of the motor fibres to the muscles, causing in them a hypertonicity.

I now propose to briefly consider the meaning of reflexes—knee-jerk and clonus, so-called reflexes. It is known that the knee-jerk may be absent in certain conditions ; you are acquainted with the reason of this, but I will mention the principal facts in relation with it to refresh your memories. The so-called patellar reflex is not a reflex at all ; it depends upon a reflex condition, but it is not in itself a reflex. The reflex arc which is necessary for the production of knee-jerk is the sensory nerve-fibre passing from the muscle-spindle by the posterior roots, and then communicating through the anterior roots, having passed across the cord, with the motor nerve. By this means the muscle tone is maintained in proper condition ; and to get a knee-jerk it is essential that there should be a certain degree of muscular tone. In ataxia, where there is degeneration of the peripheral sensory nerves

of the muscles, the knee-jerk is lost; but the knee-jerk having been lost may be recovered, and that is when the degeneration has passed over to the lateral columns. Thus, in locomotor ataxy there may be loss of knee-jerk to begin with, but subsequently high knee-jerk, in consequence of degeneration of the lateral columns. I want to consider that point with you a little. If the knee-jerk is recovered in a case of ataxia after it has once been lost, and the recovery is due to further degeneration, of course the reflex arc has not been restored. So the only conclusion is that you may get knee-jerk provided there is a certain tone in the muscle; and that it is not necessary to have an intact reflex arc in order to have even a high tone. That brings us to the consideration of clonus. It is recognised and known that all these phenomena—ankle-clonus, knee-jerk, wrist-tap, and so on—are of the same order, practically the same thing, all of them dependent upon the degree of muscular tonicity.

The explanation of the occurrence of clonus has been given by several authorities. Charcot first noticed that on the occurrence of a hemiplegia, where the internal capsule is cut across by a hæmorrhage, there is a descending degeneration along the pyramidal tracts towards the motor cells in the cord, and he advanced the opinion that the clonus was due to the cutting off of the cerebral influence. That is to say, as long as the brain had control of the motor cells in the cord, it exhibited no excessive action. The brain kept in check their normal activity. Dr. (now Sir William) Gowers, found that after the occurrence of hemiplegia you do not get clonus immediately the brain influence is cut away, but only after a certain period, which approximately was the period required for the degeneration of the pyramidal tracts down to the anterior horns. Hence he advanced the opinion that the clonus was really due to the irritation from the morbid process taking place in the anterior horns. But within the last few years it has been conclusively shown that there may be no degeneration whatever in the pyramidal tracts, and yet there may be clonus. In one of the children whom I showed you, the clonus has disappeared, and in the other child it probably will disappear. Not long ago, in a case of clonus, we would have said, here is a degeneration of the lateral columns following myelitis, and it will never re-

cover; but, as a matter of fact, it has been observed from time to time to disappear in children who have developed marked clonus in caries. Dr. Bastian advanced the theory that this clonus is the result of unrestrained energy from the cerebellum. In a case of hemiplegia due to a hæmorrhage cutting across the internal capsule Dr. Bastian thought the cerebellum, no longer checked by cerebral action, caused an excessive action on the part of the motor cells in the anterior horns. This brings me back to the point, what is clonus? In a case of ataxia, the disease may afterwards become ataxic paraplegia, in which sclerosis is developed in the lateral columns. In these cases it is obvious that clonus is not a reflex act. You need only have increased tone in the muscles to produce the clonus, without any reflex action at all. Each successive vibration or jerk of the clonus is due to a repetition of the stimulus. Having once got increased tone in the muscle, from some morbid condition in the cord, then, as in the production of ankle-clonus, for instance, it is only necessary to suddenly stretch the hypertonic muscles of the calf, and you get the sudden contraction and relaxation, repeated as long as pressure upon the ball of the foot is maintained.

In some cases you may get clonus without actually keeping up the original stimulus. For instance, in a case of hemiplegia now in the ward there was at one time a very marked thigh-clonus. When it was started the leg began to swing, and kept on for a long time, the swing to and fro being enough to excite action in the flexors and extensors alternately. The conclusion that one must arrive at as a result of the reappearance of knee-jerk (or even clonus) in ataxia, is that this clonus is permitted or is brought about after the production of hypertonicity, and is not due to repeated reflex nerve discharges from the cord. There is almost certainly a weakened condition of the cord wherever clonus is produced. This clonus is found in a very considerable variety of cases; for instance, it may occur in phthisis. When people are suffering from phthisis, they often have a very sensitive nervous system, and in them it is possible to produce an ankle-clonus. Again, it may come after great exertion. A person may have become over-fatigued from excessive exertion, and as a consequence develop a temporary spastic condition. There may even be ankle-clonus, and

they give you the idea that they may be acquiring chronic lateral sclerosis; but after a short or a longer time the parts recover themselves, the clonus disappears, and the patients recover. The explanation would be that there is a lowered condition, in the one case from a general febrile state giving rise to morbid activity of the neuron, as in tuberculosis; and in the other there is a lowered condition causing decreased resistance in the terminals of the neuron from over-strain, a lower state of physiological life being produced which is tardily recovered from; the neuron does not maintain its proper fund of energy, it too readily releases whatever energy it produces or receives from the common reservoir, so that there is a hypertonic condition of the muscle whilst the neuron remains below par. The change in the constitution of the neuron that permits of the occurrence of clonus as a morbid phenomenon must be but slight, for it is producible in health under unwonted muscular strain in certain attitudes.

The conditions in which clonus is produced in actual organic diseases of the spinal cord are to be explained in the same way. When there is a degeneration of the lateral columns, a certain amount of highway from the brain is cut off from the anterior horns, with the result that certain motor cells are thrown out of gear; they are not at work, and when they are not performing their functions they must be below par, the general tendency of idleness being to degradation. By whatever means the tracts in the cord are deprived of their conductivity, there is a certain amount of function lost in the cord, with the result that it falls below par, and permits in consequence a too ready escape of nervous energy.

I fear, gentlemen, that my remarks have not been as clear as they might have been, but I thought it might be of interest to consider with you the subject which I have chosen. Some of the conclusions I have put before you are my own, but I have ventured to speak of them because they seem to afford a reasonable explanation of the phenomena, and enable one also, I hope, to grasp more readily the principles of the subject.

MEETING OF THE SOCIETY OF ANÆSTHETISTS,

At 20 Hanover Square, January 20th, 1898.

The President, Dr. DUDLEY BUXTON, in the Chair.

DISCUSSION on Mr. Alexander Wilson's paper on "Resuscitation in Emergencies under Anæsthetics."

Dr. BOWLES said he quite agreed with all Mr. Wilson had said. He thought it was very important indeed that they should, in their efforts at resuscitation, apply one or two things which were known to be useful, and discontinue to use all doubtful methods. It had long been his opinion that too much had been done. He had seen instances of it over and over again, and he was certain very great harm was done by pulling the body about and disturbing it by trying first one thing and then another. He agreed that artificial respiration and tentative inversion were the two things most likely to be useful. Of course, in the first place they must remember what they were dealing with, namely, chloroform. Chloroform of itself was a direct and positive poison, one of the strongest known, and it was essential to remember the dosage during administration. Of course, in a Society like theirs every one understood such facts perfectly well. By observation of the patient and by experience, experts could judge well of the real progress of the case. In each case it would be desirable to know precisely what quantity of chloroform had been given, and in administering it to limit the quantity to the actual necessity of the case. He felt quite assured from observation that chloroform was more uncertain in its effects than other drugs usually were; but knowing that it was a poison, and that an overdose would kill, they should always direct their efforts to prevention rather than cure. The present paper, however, was directed to resuscitation in emergencies, and he therefore agreed with the reader of the paper that nothing, under such circumstances, was so beneficial as artificial respiration and assistance to the circulation, which must certainly be afforded in combination with the respiration. In practice it

was very important to discriminate between two forms of artificial respiration—the Marshall Hall and the Sylvester. For important reasons he was in favour of the Marshall Hall method, because at the time he with others were experimenting for Dr. Marshall Hall, their object was to discover a treatment that the public could readily and quickly apply,—not so much for cultivated doctors as for the public,—and they found that a method similar to the Sylvester method constantly failed them. It failed them because in pressing on the chest when the body was supine they often could effect no movement of air, in or out of the chest, by that method. On seeking the cause, they often found fluid and grumous matter of all sorts present in the throat. On other occasions they found no fluid there, but dissection displayed the base of the tongue in close contact with the posterior wall of the pharynx.

The reader of the paper had assumed that these facts were well known to members of this Society, but they must not forget that they were not as well known as they should be amongst those outside a society such as theirs. In the *Lancet*, in two successive weeks in April last, there were reports of two deaths under chloroform administered for surgical relief in empyema. Chloroform was administered successfully, and the anæsthetist had announced the cases ready for the surgeon. For convenience the patients were turned with the affected side upwards, and instantly respiratory embarrassment occurred, with cyanosis and apparent death, and a quantity of pus poured from the mouth. The patients were put on their backs, and artificial respiration by the Sylvester method was employed. The result of this was that a quantity of pus was driven into the bronchial tubes, and the patients died. Both cases were exactly alike in that they were both drowned in their own pus. Of course, when the speaker and his colleagues were seeking means for recovering the apparently drowned, they always had in view during these experiments the pre-existence of water and of mucus in the lungs, which must be expelled before air could enter, and therefore it was that they gave up all attempts at recovering people in the recumbent position, and placed them on their sides or faces. He knew quite well that with the Sylvester method they could introduce more air than by the Marshall Hall method, but in

cases of drowning or of pus or blood in the lungs, or in cases of hæmoptysis, he had constantly found that they could not by any method introduce air if the tubes were already occupied by foreign matter. The prone and prono-lateral positions must be adopted, but they could not use the Sylvester method, as it was usually taught, in the prone position. They could use it, however, and he had done so with good effect, if the patient were placed on one side with the bad side downwards. In hæmoptysis, in empyema, or in drowning, they could use one arm and expand the upper side of the chest, and thus get more air in than they could by the Marshall Hall method alone, and in chloroform poisoning he would be disposed to adopt it in preference to any other method; but he would never, unless under very exceptional circumstances, trust the patient on the back. He had just seen the record in the 'British Medical Journal' Epitome, of another case which happened in Germany. The man was suffering from diphtheritic paralysis of the throat, and had just been taking food when he fell down and ceased to breathe. The surgeon at once proceeded to apply artificial respiration, but the patient died. On investigation after death, the lungs were found to be full of fluid from the stomach, which had been brought up into the pharynx by pressure on the sternum, and then inhaled into the lungs by elevation of the arms in the Sylvester method. That matter could be forced from the stomach into the lungs by Sylvester's method had been proved by them in their experimental inquiry forty years ago. The Sylvester method, therefore, could not safely be used in these cases; it might, however, be used partially, *i. e.* after first placing the patient on the face and pressing on the back, he should be turned on the side only, and then the upper arm might be elevated as in the Sylvester method. By pressure on the back when the patient is prone the heart would necessarily be squeezed, and the blood thereby moved onwards in its course. By this combination of the two methods the circulation and the respiration would be assisted, and it could be made certain that they were not killing the patient by inducing suction of foreign matters into the lungs, or creating difficulties in the upper air passages, which might give rise to partial blocking and the various forms of stertor, or to complete apnœa and death.

Professor SCHÄFER said he had listened with the greatest interest to Mr. Wilson's exposition, and had seen much in it to agree with. As the result of practical experience in man, Mr. Wilson had come to very much the same result that physiologists had arrived at partly from experience of administration of anæsthetics in the lower animals, and partly from observations as to their action upon the nervous, vascular, and respiratory systems. It seemed to him that the question of treatment of overdose of an anæsthetic was not so complicated as it was generally regarded, and the manner in which Mr. Wilson had treated the subject tended to simplify its conception. It was quite clear that what they had to deal with was a condition of paralysis in an area of the medulla oblongata which comprised several very important centres of the parts which were there paralysed ; those which chiefly concerned them were the respiratory and the vaso-motor centres. No doubt other centres were also paralysed, for there was no particular reason to suppose that the nerve-cells of the various centres of the bulb were affected at markedly different periods in the action of the anæsthetic ; they might take it that they were all paralysed at about the same time, nevertheless the two centres the paralysis of which directly endangered life were the respiratory and the vaso-motor centres. The danger from paralysis of the vaso-motor centre has not been clearly recognised until comparatively late years, but has been brought into prominence of late by the work of Dr. Leonard Hill. It was a fact extremely familiar to all physiologists who had worked at the action of chloroform that at a certain stage of the action of the drug the blood pressure began rapidly to fall, and this change went on *pari passu* with the paralysis of the respiratory centre. There must also be an action upon the heart centre, but that in the bulb was probably of secondary importance. If by paralysis of the vaso-motor centre the arteries were dilated and the blood pressure lowered, the heart's beats would in any case thereby be caused to be more rapid and feebler, although the increased rapidity might be in part due to concomitant paralysis of the inhibitory centre. He did not suppose that such paralysis of the cardio-inhibitory centre would necessarily have a detrimental effect ; whether this be so or not, the effect upon the vaso-motor centre was the one which was probably the most dangerous in cases of chloroform poisoning. They could immediately counteract the effect upon the respiratory centre by employing artificial respiration ; it did not matter much which method they employed so long as they got sufficient air into the lungs ; and even the use of the bellows to one nostril, the other nostril being left open, would force into the lungs enough air, if the tongue were drawn forward, to keep up artificial respiration. So much was this the case that, as Horvath had shown, if an animal were poisoned with curare artificial respiration could be kept up in this way until the effects of the curare had passed off, which with large doses might take two or three hours or more. They need not, therefore, so much dread the effects of chloroform upon the respiratory centre, because they had means of counteracting it. But unfortunately they had not the same means of counteracting the effects of paralysis of the vaso-motor centre. The enormous fall of the blood pressure which took place in the splanchnic area could be only feebly counteracted, and, as a rule, it was too late to take measures, in the way of drugs, to counteract it when the anæsthetic had had its full effect. Another effect which chloroform had was a direct action upon the heart, and any case was very serious when so much chloroform had been given that the muscular tissue of the heart was directly poisoned. Mr. Wilson spoke of the nervous-centres in the heart, but most physiologists were inclined to agree with Gaskell that the contraction of the heart was not dependent upon nerve centres in its substance, but was due to the automatic action of its musculature ; and the trouble was rather from the action of the chloroform-laden blood upon the muscular tissue of the heart itself. That was a condition which could not be counteracted by anything short of removing that chloroform-laden blood. In physiological laboratories they did not give chloroform with the extreme care observed by anæsthetists ; they were generally anxious to get the subjects under quickly, and they usually gave large doses. It was not, therefore, very strange if they lost a certain number ; nevertheless they were extremely anxious not to lose the animals, and when they seemed likely to die they did their best to resuscitate them. In animals, undoubtedly the kind of artificial respiration which was most effectual was intermittent pressure on the chest.

It was more important to promote expulsion than to actually draw the air into the chest. That had a distinct physiological basis. It was a diminution in the size of the alveoli of the lungs which caused inspiration; this had been shown by Hering and Brewer and by Head. When air was pumped into the lung or when there was dilatation of the alveoli of the lung by any form of artificial respiration, then an expiration was probably produced; conversely, when collapse of the lung was caused inspiration was excited. This was frequently illustrated in over-chloroformed animals. An animal might be apparently dead, but when they began to exert intermittent pressure upon the chest and epigastrium, very often there would be an inspiration after each compression, and after a time the respiration might recover its normal reflex activity. But it might not recover, because they still had the dangerous condition present of dilatation of the arterioles and extremely low blood pressure, so that practically the vessels were not full enough of blood to keep up the circulation. How was this to be counteracted? He believed that probably they could help to prevent its occurrence by taking measures beforehand. It was his invariable practice, unless there was some expected result which would be prevented by atropine, to give a minute dose of that drug, so as to produce paralysis of the inhibitory nerves of the heart. The effect of such treatment was in the first place that the blood pressure was greatly raised owing to the increased action of the heart. The drug did not directly affect the arterioles, but the effect of a preliminary administration of atropine on animals was that they could administer the chloroform with less care and with less loss of life. The action of atropine in preventing a fatal fall of blood pressure was seen very markedly in cases where it was necessary to cut the spinal cord. If this were done near the medulla oblongata there was an enormous fall of pressure, and under these circumstances one was very apt to lose the animal under the influence of an anæsthetic, whereas a small dose of atropine previously administered much diminished this risk. Supposing, however, that all this had been unavailing, and they had that condition in which a patient was apparently dead, artificial respiration having failed, what else could they do? He entirely agreed with Mr. Wilson that it was not

of any use to galvanise or faradise over the area of the heart; it could not be expected that that would stimulate it to activity. Puncturing the heart rhythmically with a needle was heroic, but he did not think it was to be recommended. It might cause a contraction or two, but probably it would not be of much value. Putting a double-guarded needle into the heart and faradising might well do more harm than good, for it was well known that direct galvanisation of the heart was apt to cause that fibrillary contraction of the organ which was among the most fatal conditions which could be produced. There was more danger than there was likely to be benefit from these procedures. He had advocated as the most valuable form of artificial respiration rather that form which produced an expiration, and then indirectly through the vagus an inspiration following it, than any form of respiration which necessarily drew any great amount of air into the lungs. Still they wanted to clear the chloroform out of the lungs and out of the blood, and for this as large a supply of air as possible was needed. For that reason he would not say, do not use the Sylvester method or other methods which are known to draw in plenty of air, but they should be sure that they also exerted intermittent pressure upon the chest and epigastrium. There was the further question whether the abdomen should be compressed in order to prevent the over-filling of the splanchnic vessels with blood, and that the blood within them should be passed on to the heart. At the beginning of such pressure there was, as Hill had pointed out, a certain amount of danger, because the effect of chloroform upon the heart was usually to cause it to be greatly dilated, and if they dilated it much more by squeezing the abdomen, and forcing on into it the blood which was in the portal system, the heart might be unable to contract upon its contents (because the more the heart was distended the less power it had for each square unit of surface). At the same time, he thought that that danger should not make them give up altogether compression of the abdomen, for they need not compress it in such a way as to suddenly drive a large amount of blood into the heart. It was important to prevent the blood stagnating in the portal circulation, and this could be done by bandaging the abdomen. In fact, the late Professor Roy and Professor Adami had shown in

their experiments upon animals that compression of the abdomen by bandages was decidedly beneficial to the action of the heart. With regard to inversion, no doubt it might be efficacious in certain conditions, but he did not know that it greatly mattered whether the centres in the medulla oblongata were supplied with more or less of poisoned blood; the point was to supply them, if they could, with fresh blood, and that was the difficulty.

He would speak, lastly, on what might be effected by drugs after the evil results of over-anæsthetisation were obtained. When both the vaso-motor system and the heart muscle have become paralysed by the anæsthetic, he was afraid very little could be done; but he would indicate two drugs which might be effectual, the two, namely, which in his experience provoked the greatest amount of contraction of the arterioles, and one of which at least tended also to greatly increase the strength of the contractions of the heart. The first was nicotine; he did not know whether that drug had ever been recommended for chloroform poisoning, but even in minute doses it produced an enormous effect upon the circulation, even when the blood pressure was extremely low, as e. g. after section of the spinal cord. He was speaking of the injection of nicotine into the blood-vessels, but he had no reason to believe that it would not be equally efficacious if it were injected subcutaneously or into one of the serous cavities. Nicotine could be given in quite small doses dissolved in salt solution or in water, and he thought it might serve to tide over the evil moment. The other drug of which he had had a hopeful experience was extract of supra-renal gland. That had just as great an effect upon the arterioles as nicotine, and indeed greater, for it not only produced an enormous contraction in the arterioles, but also had an extraordinary effect upon the heart, causing an enormously increased rate and force of beat. They might ask how they were going to administer it to accomplish that end? It was not always easy at any moment and in any place to open a vein and inject supra-renal extract into the circulation; but he thought it might be perfectly possible to inject it with complete safety in extreme cases directly into the heart by means of a hypodermic syringe. He did not see how it could possibly do any harm, and it would thus imme-

diately get to the tissues which it was most wanted to affect, passing into the coronary circulation and into the arterioles, its effect would be intantaneous. It was true the effect did not last very long, but the dose could if necessary be repeated. Moreover, by the time the effect of the supra-renal extract had passed off, artificial respiration might have succeeded in clearing off the chloroform sufficiently, and there might be then a chance of saving the patient. In desperate cases they must use desperate remedies. These, however, which he had suggested could hardly be described as desperate, because there was no danger in them; they were, therefore, at least worth trying.

Dr. SILK said he was sure the Society would feel greatly indebted to Professor Schäfer and to Dr. Bowles for attending the meeting and interesting them so deeply in the subject, which was of such primary and practical importance to all of them. To Mr. Wilson they were also equally, if not more indebted, for his valuable paper, and for the trouble he had taken in coming so far in order to introduce the discussion in so admirable a manner as he had done. Practically, the whole ground had already been traversed that evening, but the subject was so very important that he thought it was everybody's duty to try and contribute something to the discussion. With regard to drugs, there could be no question that in an extreme case of over-narcosis, the possibility of getting a drug into the circulation, except in the way suggested by Professor Schäfer, i. e. by direct injection into the heart, must be very remote. But apart from this he thought that experience bore out the views which had been generally expressed, that is to say, that drugs generally had not very much effect, —such effect as they had being more in the direction of prophylaxis than anything else. Alluding to the question of the prophylactic value of drugs, most of our knowledge on this point was contained in, if not derived from, the excellent paper read by Professor Wood, of Philadelphia, at the International Congress in Berlin in 1891. It would be seen from Professor Wood's tracings that ether and alcohol were really of no value whatever as prophylactic remedies; if they did anything at all, they rather accentuated the ill effects of the poisoning when it took place. Professor Wood's observations were confirmed by the more recent observations of Dr. Waller. In his very interest-

ing communication to the British Medical Association in Canada upon the influence on the nerves themselves of the varying strengths of ether vapour and other anæsthetics, Dr. Waller showed that alcohol did no good, and the probabilities were that it accentuated the harm done by the other anæsthetics. Professor Schäfer's view of the value of atropine was, of course, a very valuable one, but he might mention that Professor Wood did not think that atropine was really of much use. Strychnine seemed to be a drug of very great value. For some time past Dr. Silk had been in the habit of giving strychnine in all cases in which he contemplated a severe operation,—injecting a small quantity (gr. $\frac{1}{20}$) immediately after the introduction of the anæsthesia,—that is to say, while the circulation was still active,—and repeating the dose once or twice if necessary; and he believed, as far as he could judge, that it had done good. The dosage was important. The general idea seemed to be, now-a-days, that the dose of strychnine given to counteract the ill effects of chloroform should be much larger than it had been the custom to give. Recently, in the 'British Medical Journal,' as much as half a grain of strychnia had been given in a case of chloroform poisoning, and in the same journal a writer stated that when he used strychnine as an antidote to chloroform over-narcosis, he gave at least fifteen minims of liquor strychniæ. This showed the importance of giving fairly-sized doses in order to get any counteracting effects. One point concerning prophylactic measures had been mentioned, namely, the prior administration of some nutrient enema. It was a point upon which he was himself very keen, because he thought it went a long way towards tiding the patient over the tendency to syncope. Of course, prophylactic measures did not directly bear upon the point under discussion, namely, the resuscitation, but it was impossible to avoid speaking on matters so closely related. The whole subject was a very complex one, as every one present knew; one writer had gone so far as to discuss it under no fewer than twenty-four headings! Speaking generally of Mr. Wilson's suggestions, Dr. Silk cordially agreed with the idea that the sheet-anchor should be artificial respiration, which might be combined with inversion, either whole or partial, and that other measures such as galvanism, &c., were of mere secondary im-

portance. The only thing was whether, in teaching, one would be altogether justified in quite omitting to refer to the secondary points. He believed they should not omit such reference. One reason for his opinion on this matter was that if the student were taught to commence the treatment of these cases with artificial respiration, that student would be rather apt to overdo it—would go on working hard at the chest, and run the risk of producing precisely the result to which Dr. Bowles had already alluded, namely, bringing up the contents of the stomach into the pharynx and thence into the lungs. The importance of this was accentuated when the patient was not really so bad as a nervous man might think. Many of the cases could be recovered by a little careful manipulation and patience. As to the symptoms of over-narcosis, there was a point which did not appear to have been alluded to, namely, the condition of over-stimulation, particularly in regard to the administration of ether, which was a very serious condition. He thought they could all recognise the condition in which the patient was over-stimulated, and the question of the resuscitation of that patient was very important. He was himself rather doubtful whether artificial respiration would do much good to a patient who was over-stimulated. He would be very much more inclined in such a case to rely upon position and time. An instance was published in the 'British Medical Journal' a short time ago in which over-stimulation occurred more as an after-effect than as an immediate effect. Those were essentially the cases in which the lateral position was called for, and it was a very strong argument in favour of the proposition to turn the patients on their right side after an anæsthetic as a matter of routine, that was, whenever it was practicable. It seemed to him that, apart from this question of over-stimulation, the cases in which they got indications of over-narcosis might, for all practical purposes, be divided into those in which the cardiac failure seemed the predominating element, and those in which the respiratory failure appeared to predominate. They could recognise cases of both kinds very well on paper, but it was very doubtful whether, in the flurry and more or less excitement of an actual administration, the differentiation was always possible; it was wise of Mr. Wilson, therefore, not to lay too much stress upon the differen-

tial diagnosis of different forms of over-narcosis. He agreed that it was right to lay stress, as Mr. Wilson had done, upon the actual question of treatment, from whatever condition the patient was suffering. Broadly speaking, there could be no doubt that the points to be attended to were, first of all, to see that the air-ways were properly cleared to enable the air and narcotic vapour to get out, and then to take measures for getting air in. With regard to that particular condition which, from its extreme gravity, stood over and above all others (what they might call the lightning-like cardiac and respiratory failure, when the patient, after being under the anæsthetic for probably a minute or two, showed symptoms of both respiration and heart failure), it did not appear to him to be of any practical use to debate the question as to whether the heart or the respiration failed first. With regard to the treatment of such cases, if he understood Dr. Leonard Hill's arguments aright, they tend to prove that this condition practically meant dilatation and engorgement of the heart, and, therefore, the object of treatment should be to empty the heart into the splanchnic area by sitting the patient up. That was a very important point, but unfortunately it was one which, as far as he knew, no one had yet attempted to decide by an actual experiment upon a patient. Dr. Leonard Hill also produced arguments against the routine proceeding of inversion or partial inversion, in the cases of threatened sudden death under an anæsthetic in the early stages. Dr. Hill advocated, as he thought Mr. Wilson did also, the use of inversion or partial inversion only in ordinary cases of overdose after a prolonged use of an anæsthetic, more especially chloroform, but Dr. Hill was against its use in cases of sudden death due to dilated heart. Dr. Hill used an argument which seemed quite feasible, viz. that by inverting the patient they simply over-distended the already distended heart. But, on the other hand, it should be pointed out that the condition of engorgement had been recognised before, and it had been urged that temporary dilatation of the heart under these circumstances might do some good by stimulating the heart to act. This argument he believed was contained in the paper by Dr. Wood to which he had already referred. The argument used in favour of inversion in its effects upon the rve-centre was that it suddenly flushed or over-

distended the nerve-centre, and so roused it into activity again. He confessed that he was inclined to take Dr. Leonard Hill's view that in these lightning-like cases, inversion was a dangerous proceeding.

Two other points to which no allusion had been made, but which he thought were deserving of attention, were the position which the use of oxygen held in the minds of the profession, and the use of tracheotomy. He thought the use of oxygen in forced·artificial respiration might be advantageous. Another point was the actual stimulation of the heart. There could be no doubt that if one could get at the heart, or could exert some pressure on the heart, it would be of advantage. A suggestion was that they could exert a great deal of pressure upon the heart by artificial respiration alone. He had some difficulty in accepting the view that much pressure could be exerted upon the heart by mere pressure on the chest. Perhaps if they tucked their fingers under the diaphragm and pushed upwards and outwards, some pressure might be brought to bear, but he was a little sceptical as to the possibility, by mere pressure on the chest wall, of controlling a movable organ like the heart, and forcing it to take on action after it had once stopped. That raised the question of getting into the pericardium, or getting outside the pericardium and taking the heart between the fingers and squeezing it. That might seem to be an extraordinary proposition to make, but it was only fair to say that it had been attempted, and was not outside the bounds of possibility. Another point was the use of large injections of normal saline solution, this solution being injected either into the veins or into the rectum, the idea being to raise the intra-vascular tension, and so stimulate the heart to take on action again. He was very pleased to hear that the general idea appeared to be against acupuncture and galvano-puncture ; they always seemed to be very extreme measures, and did not appeal to him as being capable of producing any real benefit.

Mr. BARNARD said he had worked with Dr. Leonard Hill at this subject, and had also done some work on the antidotes to chloroform syncope. When artificial respiration was being carried on, Dr. Leonard Hill believed that it was important to squeeze the heart. It was very certain that when the chest of an animal was open so that the

heart could be seen, and an overdose of chloroform was given, that the heart could be made to recommence beating by squeezing it rhythmically between the finger and thumb. This acted in several ways : it emptied the heart of the blood which had poisoned it, and enabled fresh blood to come in ; it also diminished the size of the cavities. It must be remembered that if the cavities were dilated the amount of energy required to empty them was very much greater than when the cavities were contracted. Another point to consider was the influence of artificial respiration in increasing the circulation. Dr. Hill and he did some work on the influence of respiration on the circulation. They gave a dog chloroform in such a way as to stop his respiration before his heart. They then performed artificial respiration by squeezing the ribs rhythmically, but the dog however made no effort to respire. A tracing showed that the carotid blood pressure was exceedingly low, although the heart was beating regularly. After about five minutes, when much of the chloroform must have been eliminated, they stopped doing artificial respiration. An asphyxial rise of blood-pressure commenced, and this must have supplied larger quantities of venous blood to the respiratory centre, for the rise had not proceeded far when spontaneous respirations commenced. Immediately the blood pressure bounded up with each respiration, until it soon reached its normal level. They also showed that inflation by blowing air into the lungs was not nearly so effective in carrying on the circulation as the ordinary method of producing negative pressure inside the thorax and sucking air in. Of course, animals could be kept alive for hours by inflating their lungs regularly, so that some circulation was maintained, but not in the same volume and at the same blood pressure as when the ordinary type of respiration was going on.

It had been said during the discussion that there was no rapid method of getting a drug into the body when the circulation was at a standstill. It seemed to him that the method of inhaling drugs into the lungs had been overlooked. He had passed the vapour of hydrocyanic acid with artificial respiration into the lungs of an animal when the circulation was practically at a standstill, and the effect on the heart was almost instantaneous. He believed that volatile drugs could be employed in the same way to rouse the heart and respiration of patients suffering from chloroform collapse. The drugs he had been working at were morphia, hydrocyanic acid, and ammonia. He had usually employed cats for his experiments, and of course under uniform anæsthesia. His method was to open the chest after establishing artificial respiration, and place the heart inside a simple cardiometer formed from a thick rubber tennis ball. The junction was made air-tight by drawing the flaps of the divided pericardium tightly around the ball after smearing the opposed surfaces with vaseline. A glass tube opposite the hole which admitted the heart served to connect the cavity of the ball with a tambour recording on a smoked drum. When the heart dilated it displaced air into the tambour and raised the lever. The drugs were usually injected into the jugular vein ; some were driven into the lungs with the artificial respiration. With reference to morphia, in Dr. Leonard Hill's laboratory that drug was administered to animals in the same way as Professor Schäfer had said he used atropine. Morphia was, as a rule, given before chloroform, and Dr. Leonard Hill believed that it was a preventive of chloroform syncope, and maintained the blood pressure. It was often a matter of surprise to house physicians and house surgeons how well some profoundly collapsed cases of intestinal obstruction and strangulated hernia took chloroform, and these were cases treated with opium before they were brought to the hospital. When he (Mr. Barnard) was recently at Heidelberg it was the habit of Professor Czerny to give morphia before chloroform. When the patient was placed on the table, one sixth of a grain of morphia was injected, and after this anæsthesia was produced by a much smaller amount of chloroform than is usual. The state of these patients during the anæsthetic was very good, both as to circulation and respiration. For these reasons he wanted to prove experimentally that morphia was a preventive of chloroform syncope. He took two similar cats, A and B. To A he gave morphia, but B had none. Both cats were then anæsthetised with chloroform, and the cardiometer fitted so as to give a tracing of their hearts. It was found that only $1\frac{1}{2}$ minims of chloroform injected into the jugular vein of B produced wide dilatation of the heart, whilst 3 minims were required to produce a similar effect on the heart of A, the

morphinised cat. The reason why this was so was not simple, but it was certain that the heart of the morphinised cat was in a better condition than the other. Looking at the question all round, it appeared to him that morphia before chloroform was a safer procedure than chloroform alone. As to ammonia, the traces obtained by injecting ammonia into the jugular vein were as striking as those mentioned by Professor Schäfer consequent on the administration of extract of supra-renal gland. He believed ammonia was recommended by Ringer many years ago for the heart dilated by chloroform. At that time Ringer was working upon frogs' hearts. There was no drug which he (Mr. Barnard) had encountered which contracted the heart so powerfully, emptied it so completely, and even dimpled its walls, as ammonia. When the heart dilated after this sudden contraction the systole was greatly increased. He imagined that if a few minims of liq. ammon. fort. were dropped into the mouth of a patient in a condition of chloroform syncope whilst artificial respiration was being carried on, the heart might be aroused. It was possible, however, that œdema of the glottis might follow if the patient recovered. It was in that room that he had heard Mr. Hobday say that he had obtained good results in chloroform collapse in dogs by placing one or two drops of Scheele's acid on the tongue. He (Mr. Barnard) went back to his laboratory to investigate the action of hydrocyanic in chloroform collapse. He found that hydrocyanic dilated the heart more powerfully than chloroform, and that in small doses it also greatly increased its beat. He found that when the heart was greatly dilated by chloroform, if a small dose of hydrocyanic were administered the heart was stimulated and began to beat again violently. He had tracings to show this, and he found that the stimulation of the heart preceded that of the respiration. But the margin between a safe and an unsafe dose of hydrocyanic was very narrow, often less than a minim of fresh hydrocyanic acid in some cats. He felt bound to regard hydrocyanic acid as a dangerous drug in dealing with the human heart. He had caused by artificial respiration, the vapour of hydrocyanic acid to pass into the lungs of a cat; the heart dilated at once, and efficient beats ceased; asphyxial convulsions followed, produced by acute anæmia of the medulla. Yet little of the hydrocyanic could have reached the medulla. When the poisoned air was driven into the lungs, a quantity of blood in the lungs was impregnated with the hydrocyanic acid to a very high degree. This blood reached the left ventricle, and without time for mixture or diffusion was instantly supplied to the coronaries, which are the first branches of the aorta. The poison therefore reached the heart muscle-fibre before any other tissue of the body. As the percentage was so high it paralysed the heart, which therefore could not drive the circulation further. Another proof that the hydrocyanic acid did not become mixed through the body was that the blood was black, whereas blood which had come under the influence of hydrocyanic acid would have been cherry-coloured. He also had some tracings of the action of the heart during changes of position of the animal. The heart was contained in the cardiometer he had mentioned, and had been dilated by chloroform. When the animal was placed head down or the abdomen was squeezed, the heart was further dilated to nearly double its size. He would remind them of that experiment of Dr. Leonard Hill's in which they had the chest of a dog open and were watching the heart. Just the right dose of chloroform had been given so that when they tilted the foot of the dog-board up the heart stopped beating, and when they lowered it the heart recommenced, and this was done several times. In most instances distension and chloroform poisoning combined to stop the heart beat. If the distension were very great only a little chloroform in addition would stop the heart. If the heart were deeply poisoned only a little distension would produce the same fatal result.

The PRESIDENT said he would like to mention that the use of morphine before chloroform had been familiar to anæsthetists for very many years; it had been used very largely on the Continent and elsewhere, and its employment in this connection very fully reported in current medical literature. The use of ammonia as an antidote to chloroform was suggested, he thought by the late Sir Benjamin Ward Richardson, who in his 'Lectures' published some thirty years ago fully described experiments made by him to prove its antagonism to chloroform. Subsequent experience had not, unfortunately, realised the expectations formed by that observer.

Mr. WILSON, in reply, acknowledged the force of Dr. Bowles' remarks, and agreed that in cases in

which there was fluid in the lungs, Marshall Hall's method of artificial respiration would be better than Sylvester's. Replying to Dr. Silk, he expressed doubts as to the advisability of giving hypodermic injections of strychnine either before, during, or after severe operations, as so many cases recovered perfectly well without this treatment, which might in itself be dangerous. The best method of counteracting shock was by the judicious preparation of the patient before the operation, and careful treatment afterwards by means of warmth, position, and the administration of nourishment by nutrient enemata. Mr. Wilson also referred to the unfortunate arrangements of hospitals, by which operation cases were sometimes kept for hours without food, and thus placed in an unfavorable condition for resisting shock. In the treatment of emergencies by inhalation of oxygen, it was surely indicated only in cases in which there was some obstruction to respiration by mucus or fluid in the lungs, *i. e.* to cases in which the active lung area was diminished. As regards Mr. Barnard's experiments with hydrocyanic acid, in the cases in which death was ushered in by anæmic convulsions Mr. Wilson pointed out that convulsions were also a prominent symptom in certain fatal chloroform accidents, and were produced by sudden anæmia of the respiratory centre, caused by the failure of the circulation at an early stage of the anæsthesia.

The PRESIDENT said they were greatly indebted to speakers for coming to the meeting and enlightening them. It was valuable to have sidelights thrown upon one's work from men who attacked the subject from another point of view. Speaking for himself, he had learnt a great deal that night, and that would probably be the case with many of them. He was struck by the fact that men whose duty did not lie in the direction of giving anæsthetics had thought the subject out so very carefully, and arrived at a very adequate and just knowledge of matters which only concerned them as by-issues. It behoved them to look to their own laurels lest their own subject should be better known to others than to themselves. The only way to know as much about it as those outside was to invite and welcome warmly those who came amongst them and who gave them their views. He only regretted that one or two of those present had not, owing to want of time, been able to give the meeting the benefit of their views, but he trusted their contributions would be forthcoming on another occasion, and so be a pleasure deferred.

NOTES.

The Injection of Artificial Serum as a Method of Preventing Death from Extensive Burns. — The serum employed by Tomasoli ('Monatsschrift für prakt. Dermatologie,' Bd. xxv, No. 2) is a solution of sodium chloride and sodium bicarbonate. In a sixty year old woman with an extensive burn of the third degree, injections of from 300 grammes to 1000 grammes of serum in three days did not prevent a lethal termination. In a second case a young man, twenty years of age, with burns of the first, second, and third degrees, covering the entire right side of the chest, the right axillary space, the whole of the right arm, shoulder, back, and buttock, recovery took place. The patient received daily from March 13th until April 6th serum injections of from 250 grammes to 500 grammes each, and on May 3rd left the clinic in an improved condition. Tomasoli experimented on animals. The hind legs of rabbits and dogs were burned or scalded by being immersed in water the temperature of which was gradually raised to 70° C. All animals burned in this manner died within thirty-six or forty-eight hours. Six rabbits of the same weight as those employed for comparison received injections of 50 grammes of artificial serum immediately after being burned. Four of them died within the first twenty-four hours; the remaining two continued to live. Ten dogs, burned as has been described, were daily injected with from 150 to 200 grammes of artificial serum. Only two of them died, and in these death occurred a few hours after they were scalded. All test animals that did not receive serum injections died within the first two days, notwithstanding the fact that they were selected and kept in a practically identical condition with the other cases. The writer also states that if serum be taken from one of these scalded dogs (not treated by saline injection), or if from the flesh of one of these animals an extract be made, and a definite quantity of this serum or extract, propor-

tionate to the weight of the animal experimented upon, be injected into a healthy dog, the dog will die. On the other hand, if a dog in practically the same condition as the other one be injected with artificial serum immediately after receiving a lethal dose of the extract, this dog will not die.

Medical Record, January 29th, 1898.

Large Doses of Ether in the Treatment of Uræmic Dyspnœa.—After all that has been said of the injurious action of ether on the kidneys, it is interesting to learn that M. Lemoine and M. Gallois, in a communication made to the Société de Biologie, an abstract of which appeared in the 'Journal des Practiciens' of July 3rd, 1897, recommend its use in large doses in the treatment of various forms of nephritis, especially as a powerful means of mitigating and even curing dyspnœa due to uræmia. The authors state that one of them has employed this treatment for nearly ten years, and has succeeded in arresting with it the gravest forms of uræmic respiratory disturbances, provided there was no actual renal lesion. It may be presumed that by this the authors mean no advanced lesion, for they go on to say that uræmia due to acute nephritis, to acute renal congestion, to renal congestion occurring in the course of sclerotic nephritis, or to the infectious forms of nephritis, stands the greatest chance of being cured by means of the ether treatment. They aver that it is only the uræmia depending on slow disorganisation of the kidney by arterio-sclerosis that does not yield to this treatment, although the comatose and convulsive forms are not readily affected by it.

The treatment consists in giving every half-hour or every hour, according to the severity of the case, two or three teaspoonfuls of ether in a little sweetened water. It is better, the authors say, to give part of the ether subcutaneously—for example, to give a subcutaneous injection of two or three cubic centimetres of ether every three hours instead of the doses then due by the mouth. They say that they have given to some patients more than three hundred cubic centimetres without producing the least untoward effect, not even drunkenness; but it does not appear from the abstract into how many doses this amount was divided, or whether it was given hypodermically or by the mouth. M. Lemoine and M. Gallois state

that the ether occasions an abundant diuresis, improves the pulse, and relieves the respiratory spasm. They regard its employment as worthy to be classed with that of bloodletting so far as the result is concerned.

New York Medical Journal, July 24th, 1897.

The Work of Digestion and the Excretion of Nitrogen in the Urine (N. V. Riazantseff).—The increase in the urinary nitrogen which immediately follows a meal is believed to be due to the increased work of digestion. Foods which produce an increased activity of the secreting glands act in this way more efficaciously than those which produce less activity, but even acidified water (introduced, in a dog, into the stomach by a fistula) causes the glands to secrete, and this is followed by a rise in the nitrogen excreted in urine. —*Arch. des Sci. biol. St. Petersburg*, 4; *J. Chem. Soc.*, 1897.

A Handbook of Diseases of the Nose and Pharynx. By J. B. Ball, M.D. Third edition, with 54 illustrations.—London, Baillière, Tindall, and Cox.

The author has successfully achieved in this volume the somewhat difficult task of compressing into moderate compass a very useful and practical account of the symptomatology and treatment of nasal and pharyngeal disease, with the gratifying result that the practitioner and senior student have at hand a reliable text-book. Some pains have been taken in the preface to this third edition to justify the account contained in it of the anatomy and physiology of the nose and pharynx, and it must be admitted that there is much force in the statement put forward, that in anatomical and physiological works the information required is arranged under so many and various headings, involving a consequent loss of convenience to any one desiring the anatomy and physiology of these parts placed before him in a comprehensive but succinct form. As this work has now reached the third edition, it is quite clear that the medical public have found it useful to possess a clear account of the subject in question, and it is only necessary to add to our present notice of this volume a very few words drawing attention to the additions and changes the author has thought fit to make, especially in regard to diphtheria, accessory sinuses, and septal deviations.

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NOTICE.

ON GRANULAR KIDNEY, AND WHY IT IS SO OFTEN OVERLOOKED.

ILLUSTRATED BY CASES.

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PART I.

GRANULAR kidney is a disease much written and talked about, yet there is hardly any which is more often overlooked; and that not because the evidences of it are obscure, but because though obvious enough, they are often not so prominent or striking as to force themselves upon the attention.

The signs of the disease are plain. They consist (1) of cardio-vascular changes, *i.e.* thickening of the arteries and hypertrophy of the left ventricle; (2) of urinary changes, *i. e.* increased frequency of micturition, and a large amount of urine of low specific gravity containing small amounts of albumen; (3) of degenerative changes, especially in the eye, leading in the later stages to albuminuric retinitis; (4) and of defects of nutrition or of toxic effects leading to miscellaneous symptoms of very varied character.

Clinically the cases present themselves with the signs in reverse order,—that is to say, the miscellaneous symptoms come first; and it is because these admit of other interpretations that granular kidney, which is the real cause, is often not suspected.

Granular kidney is a very insidious disease, which develops slowly and without attracting attention for some time; but the cardio-vascular changes are obvious quite early, and make the diagnosis easy, though, as a rule, it is not until the disease has lasted some time and is well established that any discomfort arises which brings the patient to the doctor.

The pulse quite early in the disease presents peculiar and characteristic signs; and if the pulse

were more thoughtfully and systematically examined the suspicion of the disease would be more often aroused, and granular kidney be less frequently overlooked.

In examining the pulse there are several points to investigate. (1) The course of the vessel,—whether the artery is straight or tortuous ; (2) the condition of its walls, whether they are thickened or not; (3) the tension ; and lastly, (4) the pulse-wave, and the characters of its parts, viz. the upstroke, the crest of the wave, and its fall. In granular kidney striking changes occur in each of them. The arteries may be tortuous even in quite young people; they are without exception thickened, the tension is raised, and the pulse-wave has a peculiar character, for the upstroke is somewhat low, the top of the wave is square or rounded, and the fall gradual. These peculiarities are very obvious to the finger, and yield to the sphygmograph the characteristic square or round-topped tracing.

Thickening of the arteries.—Of course the arteries become thicker as age advances, and no absolute law can be laid down which will determine whether an artery be more thick than it ought to be at that time of life ; yet we may say that up to the age of forty, or possibly later, the arteries should not be felt easily. The best way to estimate the thickness of the vessel is to place the finger on the artery at the wrist over the end of the radius, and then with the point of the finger to try and roll the vessel under it. If the vessel cannot be felt at all when flattened out in this way, or only just felt like a piece of thin folded tape, the artery may be regarded as not thickened. When markedly thickened it feels like a pipe stem, and is rolled easily from side to side.

The other common condition in which the vessels are thickened and tortuous is atheroma ; but atheroma is a disease of later life, and the thickening is patchy and not uniform. No doubt the thickness of vessels in different persons varies within certain physiological limits. Atheroma, it is true, may sometimes develop early, and granular kidney late ; there may also possibly be other rare forms of arterial thickening besides these two ; but I think we may go so far as to lay this down as a good general rule, that where the arteries are markedly thickened for the age granular kidney is not improbably the cause.

The next point to consider is the tension. This is almost invariably raised, and depends upon the contraction of the hypertrophied vessel. In the later stages of granular kidney, or where the general health is greatly reduced, the tension may become low; this is due to loss of vascular tone, and is therefore a bad sign. Indeed, we may say that, although it would be better for a patient not to have granular kidneys at all, if he has granular kidneys it is best for him to have a high tension ; *per contra,* if the tension be low he will be the better for the administration of some drug like digitalis, which would have the effect of raising the tension again. This sounds somewhat paradoxical, but I have no doubt as to its general clinical truth.

I may here mention the fact, which is not generally known, but of which I have had several opportunities of observing myself, viz. that in the later stages of granular kidney the tension very frequently varies at short intervals of time, so that at one visit the tension may be found high and at another low. These changes may even be sometimes observed to take place quite rapidly, while the finger is resting upon the pulse. Such instability of tension is, of course, a very bad sign. It is not common, and I have myself observed it only in quite the latest stages of the disease.

One other reason why granular kidney is often overlooked is an erroneous impression as to the age at which granular kidney is most frequent. It is commonly stated to be a disease of the middle period of life. That is quite true in the sense that it is at this period that the symptoms of granular kidney become prominent. But, as I have already said, granular kidney is an insidious disease, and, as far as we know, takes a very long time to develop. If the late and characteristic symptoms of the disease only develop in the middle period of life, it is quite clear that the disease itself must have begun some years before. Apart from that, we know that there are cases of granular kidney which die with all the symptoms of extreme disease at quite early periods of life. One of the most characteristic cases I ever saw occurred in a girl of eighteen, and the disease must have commenced much earlier to have reached its final stage at such an age. Since attention has been drawn to this point instances of granular kidney in early life have been fairly frequently recorded. An inter-

esting series of cases in very young patients was brought before this Society not long ago by Dr. Leonard Guthrie.

We have no facts at present, I believe, which enable us to judge of the rate of development of the disease, yet we know that the disease may last for years before grave symptoms develop.

The disease is probably degenerative in character, and may possibly be inherited. I have seen one or two instances in which more than one case occurred in a family. Its cause is so far undetermined.

There is still the same difference of opinion now that there has been from the first, as to whether it is a general vascular disease with secondary kidney changes, or a primary kidney disease with secondary changes in the vessels. On the whole, as far as my observation goes, I am inclined to the former view. If that be the case it might be possible to have the cardio-vascular changes without the characteristic renal changes, and I have seen one case which I think bears out this interpretation.

The relation between acute nephritis and granular kidney has often been discussed, and I think, from what I can see, that there is a divergence of opinion between the present teaching of pathological anatomists and that of clinical observers. Every one who has examined the kidney in acute and chronic nephritis will admit that acute nephritis is not purely and simply an inflammation of the cellular part of the organ, but that it is associated, as of course one would a priori expect, with interstitial or stroma changes, and that these interstitial or stroma changes become more marked the longer the inflammation lasts; so that pathologically there is good reason to maintain that a form of chronic interstitial nephritis may result from what is commonly called chronic parenchymatous nephritis.

But admitting this, it does not necessarily follow that the clinical disease we describe as granular kidney should develop. We know perfectly well that it is very unusual in granular kidney to get any history of the symptoms of acute nephritis. I have for the last twenty years been looking out for cases of acute nephritis which can without undue assumption be proved to have ended in granular kidney. Although I have seen some cases which might bear that interpretation, I have never yet been able to satisfy myself on this point. Some

little time ago a case was sent to me which was thought to establish the fact, and at first it seemed to do so, but on investigation again I found that that conclusion was not fully warranted. That chronic interstitial changes in the kidney may follow pathologically upon the lesions of acute nephritis we must all admit; but it is another question whether the clinical disease which we call "granular kidney" is the consequence of acute nephritis, and of that there seems to me to be little clinical proof.

Granular kidney and acute nephritis may concur in the same patient; the mere coincidence, however, does not prove anything as regards the antecedence of the one or of the other. In some cases the contrary relation between the two affections exists, i. e. we know the patient to have granular kidney already, and we observe acute nephritis develop as an intercurrent affection. In other cases the patient is seen for the first time with acute nephritis, but examination reveals thickened arteries, high tension, and even albuminuric retinitis, changes indicating an advanced stage of granular kidney, which must, therefore, have been the precedent disease. Indeed, I am coming more and more to the conclusion that acute nephritis in the adult indicates some already existing chronic condition of disease in the kidney. Just as acute nephritis in children raises the presumption of antecedent scarlet fever, so in the adult it raises the presumption that the kidneys were previously unsound, and in many of these cases the antecedent disease is granular kidney. Of this the following case is an illustration.

CASE I.—A man of 32, previously in good health, was seized on November 19th with headache and swelling of the ankles and feet; the urine was dark. On the 25th November he was admitted as a case of acute nephritis; the urine was found to be of 1003 specific gravity, contained a third of albumen, and a fair amount of blood, with a considerable number of epithelial and granular casts; the artery was thickened and the tension high; the pulse was unusually slow, averaging about 50 beats, sometimes a few more, sometimes a few less. In a few days all the œdema disappeared, and the albumen greatly diminished. By November 30th the albumen had all gone, except the slightest possible trace; the urine was of 1014 specific gravity; there were no casts or blood, and its amount was large, averaging 80—90 oz. in the day. The thickening of the arteries, of course, continued, and the tension remained high. The eyes were carefully examined, but no albuminuric retinitis found. The patient was soon allowed to get up, and in about three weeks from the time of admission left

the hospital. For several weeks he continued well, and then returned with a repetition of his former symptoms— viz. a large amount of albumen, some blood, and casts. He was kept in bed, and within a week was well again. He has since continued well.

It is quite clear in a case of this kind, where the symptoms of acute nephritis so rapidly passed off, that the thickening of the arteries and the high tension could not be accounted for simply by the intercurrent attack of nephritis. There can be no doubt in this case, too, although the albuminuric retinitis was not present, that the patient suffered from granular kidney, and that the acute nephritis had developed in a patient whose kidneys were unsound to start with.

Even allowing that some cases of acute nephritis might end in granular kidney, and deducting the small number of cases in which this might possibly be the explanation, we are still left with the majority of cases of granular kidney in which some other cause must be sought. What that cause is we do not know.

Albuminuric retinitis is a very characteristic condition, and although some other forms of retinitis may occasionally resemble it, e. g. the optic neuritis of cerebral tumour and the retinitis of diabetes, still, speaking generally, its appearance is almost pathognomonic. It is, however, a symptom which occurs only late in the disease, and when albuminuric retinitis is well marked life is rarely prolonged. Albuminuric retinitis, therefore, is not much help to us in the diagnosis of the early stages of the disease; for this we must still go back to the cardio-vascular and urinary changes.

At this point another interesting question arises. Are the lesions of albuminuric retinitis ever found in cases of chronic parenchymatous nephritis apart from granular kidney?

Up till lately I should have answered this question in the negative, judging from my own observation. Within the last twelve months I have seen two cases of what was apparently an acute nephritis passing into the chronic stage, and which both developed albuminuric retinitis of a typical character. They were both young people; one was a girl of fifteen, and the other a young woman of twenty-eight years of age.

Case 2.—In the first case, the girl of 15, the acute nephritis ran a long and obstinate course; the arteries, at the time she came under observation, were somewhat thickened, and became more so during convalescence. All the œdema that she had disappeared, and the casts and blood vanished from the urine; but she had a considerable amount of ·lbumen present, even when she left the hospital. It was

not until some few months later that I observed the albuminuric retinitis, which she certainly did not have on leaving the hospital. I am inclined to think, because this case ran an unusual course from the commencement, that the kidneys were not sound to start with, and the patient certainly had the ordinary signs of granular kidney at last. It would be highly desirable to see what the exact condition of the kidneys is after death, but the child is in fairly good health, and, as she is an out-patient, I may not have an opportunity of seeing her during her later illnesses, so that this case is inconclusive.

Case 3.—The second case, however, is more striking. The patient was a sick nurse who had no renal symptoms until a few weeks before I saw her, when she developed the ordinary signs of an acute nephritis, became very œdematous and extremely ill. Her health, however, had been failing for some months before, and she went into St. Mary's Hospital to have a new set of teeth, because the trouble she had with her digestion was thought to be due to imperfect mastication. There were, however, at this time no urinary symptoms as far as I could gather from the notes.

The case ran the ordinary course of an acute parenchymatous nephritis at first, but ultimately became chronic; the patient became more and more dropsical— more and more water-logged. The eyes were frequently examined and found normal. After being ill four or five months the patient developed an acute conjunctivitis, which rapidly became blennorrhœic, with great pain and swelling and serious impairment of vision; the cornea became somewhat opaque, and there seemed at one time great risk that the patient would lose her sight. The conjunctivitis was evidently of a septic character. The patient was very ill, and her condition at the time caused great anxiety. However, under the ordinary treatment this condition passed off, and the sight ultimately recovered itself completely. At this time and for some time afterwards there were no retinal changes at all. About two months later the eye being examined in the ordinary routine way, although there were no symptoms to point to any affection of vision, the patient was discovered to have well-marked albuminuric retinitis, with numerous small, brilliant, sparkling, white patches round the yellow spot, and a certain number of small, irregular hæmorrhages in that region. The condition was about the same in both eyes.

This case seems to be conclusive, for there were no other signs of granular kidney. The patient's artery was not thickened, and the tension was low. We shall have in this case to wait for a post-mortem also. If the kidneys in this case are not granular, the point will be conclusively established that albuminuric retinitis may occur in the later stages of parenchymatous nephritis. The only further question that might be raised in relation to this case is whether the hæmorrhages were not due to anæmia, for the patient became profoundly anæmic; but if that were so (and it is possible), it would not explain the white patches, which I have never seen in any form of anæmia.

I now leave these general considerations of diagnosis, and turn to the more purely clinical side of my subject.

I have already stated that it is usually the indefinite and miscellaneous symptoms which bring the patient to the doctor; symptoms in which there is often nothing to directly suggest the diagnosis of granular kidney, and that for these reasons the disease is often overlooked. I propose to consider some of these symptoms, and to illustrate them by cases.

One of the commonest results to which the vascular degeneration leads is **hæmorrhage,** and this may be the first grave symptom of disease.

I need not refer to *apoplexy*, for in this case the cause of the disease sinks into insignificance beside the result it has produced. The frequency of granular kidney as the cause of cerebral hæmorrhage is fully established by post-mortem statistics. This we may say, that cerebral hæmorrhage in early middle life or in the young, where it is not due to syphilis, is not infrequently found to be connected with granular kidney.

The hæmorrhage is not always large enough to produce the symptoms of apoplexy; they may be very small, and of that peculiar kind which leads to what are called miliary aneurysms. If these are numerous they produce the same result as one large hæmorrhage; but if they are few in number they may produce merely the signs of a very limited lesion, whether in the brain, medulla, or spinal cord. Such limited lesions are of course rare, but in cases where the symptoms indicate them the signs of granular kidney would explain their occurrence.

Other hæmorrhages, which are not of such immediately serious character as apoplexy, are of more interest from our present point of view; the first I will take is *epistaxis*.

CASE 4.—E. J—, æt. 44, a clerk, was admitted into St. Bartholomew's Hospital for severe epistaxis. His previous history appeared to be fairly good, and he had during his life suffered from nothing in particular, except attacks of quinsy from time to time. He had syphilis at the age of twenty-two, but with that exception had had no special illness, except two years before, when on consulting a doctor he was found to have albuminuria; but he had at that time no swelling of the legs or ordinary signs of acute nephritis. One month before admission his sight began to fail him somewhat, and about this time he began to be subject to morning sickness. Otherwise he was in his usual health until the morning of August 7th, when he woke and found his nose bleeding. This stopped of itself in the course of the day, but on August 10th recurred, and became so severe that the left nostril had to be plugged. This stopped the bleeding until he coughed

out the plug, and then it began again, when he was sent to the hospital and admitted, after several attempts had been made in the surgery to control the bleeding without success. In the wards the bleeding lasted on and off for nearly a week, and was very severe, so that it was necessary to plug both nostrils behind and in front. He must have lost on the whole several pints of blood, and became very weak and pale.

The patient was a stout man but very anæmic and feeble, and spoke in a weak, whispering voice. The pulse was 100; the tension raised; its volume good; the artery thickened, but not tortuous. The heart seemed natural, and no signs of hypertrophy were obtained. The skin was somewhat dry and harsh; the odour of the breath and skin somewhat urinous. The urine was of low specific gravity, containing about one tenth of albumen and a certain number of granular and blood casts with some epithelial detritus. The sight was greatly affected. With the left eye the patient could only count fingers, and with the right he could hardly read. On examination with the ophthalmoscope well-marked albuminuric retinitis was found in both eyes, with abundant hæmorrhages irregularly scattered over the fundus, and considerable swelling of the discs. In the left eye there was also a small peripheral detachment of the retina in the south-west segment. The quantity of urine was about normal, and varied from 40 to 60 oz. daily.

After the hæmorrhage had stopped there is little to record, except that the patient became progressively weaker.

A few days later the urine was examined again, was found to be 1012 in specific gravity, to contain about one twelfth of albumen with a great many casts, some large and hyaline, some cellular with many granular epithelial cells. Micturition was frequent, and the patient had to rise about three times during the night to pass water.

The patient was placed upon a sixth of a grain of nitrate of pilocarpine three times daily. This produced a fairly good action of the skin. He also had vapour-baths from time to time for about half an hour, but these seemed to make him faint.

The urinous odour from the breath and body became more marked. He vomited occasionally without obvious cause.

The temperature, which for a few days after the epistaxis had risen to about 100° for a short time each day, after about ten days became markedly subnormal, and got lower day by day. With this depression of temperature the patient's strength also flagged, and he became somewhat wandering in his mind.

On the 26th he grew very much weaker, and began to have some difficulty in his breathing, which became of a " Cheyne-Stokes " character, and there was a good deal of rhonchus in the chest. He was very restless at night and faint, but some bromide and chloral gave him sleep. He complained from time to time of numbness in both his legs.

The breathing became gradually more and more laboured, and the weakness greater, and finally the patient died on the 26th, just six weeks from the time he dated the commencement of his illness, and three weeks from the onset of the epistaxis.

His first symptoms were not those of illness in any way, but simply failure of sight.

Post-mortem examination.—A well-nourished, powerfully built man. Both lungs œdematous and markedly emphysematous, only a normal area of heart wall being exposed, though the heart was so large. A moderate amount of fluid in both pleural cavities. The heart, with the pericardium, which was everywhere closely adherent to the heart, weighed 23 oz. Very great hypertrophy of the left ventricle, the wall of which had in places a thickness of over an inch. Right ventricle not markedly hypertrophied, but the cavity dilated and full of post-mortem clot. Slight atheroma of the coronary arteries, and some calcareous patches in the aortic valves, which were, however, competent. All the vessels of the body atheromatous to a slight degree, especially the arteries of the circle of Willis. The brain decidedly anæmic, but with no subarachnoid œdema. The liver large, weighing 80 oz., smooth on the surface, but unduly hard, with a considerable increase of fibrous tissue in the organ, and some local perihepatitis. The kidneys weighed 11 oz., were grey and firm, the capsules adherent, and the surface granular. On section there was obviously much connective-tissue increase, but both on the surface and on the sections there were extensive pale areas of fatty change. There were no urates in either great toe joints, or other sign of gout. In both eyes well-marked optic neuritis with swelling of the optic disc, and round the discs numerous flame-shaped hæmorrhages; no white patches were obvious on the retinæ. In the left eye, that in which the attachment of the retina had been observed during life, there was no sign of hæmorrhage behind the retina, so that the effusion must have been serous.

CASE 5.—In another case which I was asked to see by my friend Mr. Rawlings, the lad, 17½ years of age, was subject to frequent epistaxis. He also suffered from frequent headaches, had thick arteries, an hypertrophied heart, and a trace of albumen in the urine. I have no doubt that in this case also, though in so young a lad, the epistaxis was consequent on granular kidney.

It is probable that *hæmorrhage* may occur *from the pharynx*, *from the stomach*, and *from the bowels*, but conclusive cases of the kind are rare, and in the absence of post-mortem examination it would be difficult to satisfy a sceptic.

I have seen one or two cases recently in which there was oozing from the gums, and occasionally from the pharynx, which may have admitted of this interpretation, but they are too indefinite to speak decidedly of; anything like an abundant hæmorrhage I have never seen from these places.

Only last month I had a case under my observation which may be an instance of *hæmatemesis* in connection with granular kidney. The patient had never had any signs of gastric ulceration at any time in his life, and had had three definite attacks of hæmatemesis.

CASE 6.—He was a man of 45 years of age, fairly well nourished, but a little pale; a cab-driver, but a total abstainer for the last thirteen years. The arteries were greatly thickened, the tension high, and the heart slightly hypertrophied. At times there was a small amount of albumen in the urine, but it was often absent. Four years ago he had an attack of profuse hæmatemesis, and brought up one or two pints of blood. He had no definite gastric symptoms of any kind, and nothing whatever pointing to the presence of ulcer then or subsequently. This attack left him for a time very weak, but he recovered and went on well till a few weeks ago, when he had another attack of hæmatemesis, bringing up also a considerable amount of blood. A fortnight ago he had another attack, bringing up about a pint of blood, and it was this which brought him to the hospital. The case was obviously one of granular kidney, though there was no albuminuric retinitis to make the diagnosis incontrovertible. The only other question was whether anything of the nature of gastric ulceration existed. All that I can say is that there was no sign and no history of it. This, of course, is not quite conclusive, for the signs of gastric ulcer may often be latent. There was, at any rate, no evidence whatever of cirrhosis of the liver, and the history of total abstinence for so many years was against it.

Hæmorrhage from the bowel I have never seen myself in granular kidney, but at the same time I think it may happen, and I have recently heard of a case which admits of this interpretation.

Hæmoptysis in the course of granular kidney, although I have no doubt it occurs, I have never myself actually seen.

Hæmoptysis of this kind probably stands in the same relation to granular kidney as the hæmoptysis of old people does to atheroma. One of the last papers which the late Sir Andrew Clarke wrote was on what he called "Arthritic Hæmoptysis" of old people. The name, though a striking one, is not really a good term, but by it was meant that old persons may suffer from hæmoptysis, even to a considerable amount, owing to disease of their vessels the result of atheroma, this change being perhaps the consequence of gout.

A more interesting and important class of case, because less generally recognised, is that in which *hæmorrhage* takes place *from the bladder*, on which I have some personal experience to offer. I do not know that this condtiion had been described until the paper which I wrote some years ago on the subject. Since then several other cases have been recorded, and the condition has now become recognised.

CASE 7.—The case which led to the paper I have referred to was a very striking one; it occurred in the course of

granular kidney, and the patient passed urine which was bright red in colour, the hæmorrhage being pretty free. On the patient's death nothing was found but a granular kidney.

In the same paper I recorded a very striking case communicated to me by Dr. Sharkey in which the hæmorrhage was so copious that it was thought there must be a calculus in the bladder. Being in a girl it was proposed that the urethra should be dilated, and the bladder explored with the finger. However, objection was taken to this, nothing was done, and a short time afterwards the patient died. Post mortem nothing was found wrong with the bladder, but the girl was suffering from granular kidney. My colleague, Mr. Bowlby, has since described several other cases of the same kind with post-mortem examination.

Although the hæmorrhage in these cases is not often so free as I have described, it occurs very commonly in small amount and is often recurrent; indeed, I believe in doubtful cases that this may suggest the nature of the ailment and considerably assist prognosis.

CASE 8.—Thus I remember a lad who was sent into the hospital with albuminuria, the result, it was thought, of acute nephritis. However, no definite signs of acute nephritis developed, but he continued frequently to pass a small amount of blood in the urine; the attacks would last a few days, then disappear for a time, and subsequently recur without obvious cause. There was no question of calculus in this case, but the arteries were thick, the heart somewhat hypertrophied, and even in the intervals when the urine contained no blood a small quantity of albumen was present in it. I had the man under observation for a considerable time, and have no doubt that he was suffering from granular kidney, although he was only about 18 years of age when he first came under my care (cf. case 13).

Hæmorrhages into or behind the retina are of course almost a part of albuminuric retinitis, and it is worthy of note that they often are abundant in the retina, and yet produce but little if any defect of sight; however, this depends more upon their seat and their size than upon their number.

If they occur in or close to the yellow spot the sight will suffer seriously, or if the hæmorrhage be large enough, as I have seen it, to produce detachment of the retina, of course the patient may suddenly become almost blind.

I have described some cases of *detached retina* in granular kidney, but it is rare for the effusion which has caused the detachment to be blood; it is usually serum.

In one or two instances I have observed hæmorrhage in a very peculiar place, viz. in the loose tissue *behind the eye,* and it has then produced very puzzling and indefinite symptoms.

Great pain is experienced in the orbit, and the eye is protruded, but it is often not till a few days later that the discoloration becomes evident, which makes the diagnosis of hæmorrhage plain; and even then the cause may be obscure if the possibility of granular kidney be overlooked.

I have seen small *hæmorrhages beneath the conjunctiva* to be the first symptom to bring the patient under observation. They may occur quite spontaneously without any obvious cause, and without any symptoms which would bring the patient to the doctor, if it were not for the disfigurement caused by the colour. In one case of this kind which I can recall the patient died not long after of cerebral hæmorrhage.

Strange to say, I do not think hæmorrhages into the skin occur,—at any rate, I have never seen anything of the nature of purpura which I could associate with granular kidney.

From the arteries it is natural to pass to the heart.

Heart failure is very frequently the first symptom that causes the patient anxiety. Thus a man of middle life, who has thought himself hitherto to be in good health, notices his breath to become a little short and his heart to palpitate on exertion; he has a little cardiac pain, and his feet begin to swell. He comes to the doctor, and is found to have a large heart, hypertrophied and dilated, without any evident cause for it in the heart itself. The attention then is naturally turned to the kidney, and the signs of granular kidney are discovered; yet the patient has been, as far as he knew, in perfect health until these signs of weakness of the heart developed. This may happen in the old as well as in the young.

CASE 9.—A man of 74 came under my care with a history of his feet having begun to swell about five months ago. He gradually died of failure of the heart, and at the autopsy the heart was found to weigh 16 oz., and to be fatty. This might have been explained by atheromatous changes in the vessels, but from this they were unusually free; the kidneys were markedly granular; yet the patient had only passed a little albumen during the last few days of his life.

I have recently seen a similar case in a woman of seventy-two.

However, it is chiefly in younger people that the diagnosis of granular kidney comes in to explain cases of heart failure in the absence of any primary heart mischief.

Now and then the patient comes under observation with *violent cardiac pain*, of the nature of angina, just as in other cases of left ventricle failure.

CASE 10.—I remember seeing a woman some time ago who gave a very definite history of cardiac pain of angina-like character, attended with very severe syncope. I never saw her in an actual attack. Being a feeble and anæmic woman, without any gross disease of the heart, I thought that the symptoms were probably nervous in character, and connected with her anæmia. However, one day she had an attack of the same kind and died. There was no post-mortem examination. Evidently the attack was one of angina, and I now believe, on thinking the case over, that it was connected with granular kidney.

Inflammation of serous membrane is not infrequent in the course of granular kidney, and may occur without the usual symptoms to suggest its presence. The pericardium and pleura are the two membranes most frequently affected.

Pericarditis is a by no means rare complication of granular kidney, but it often has this peculiarity, that it may produce very loud friction but next to no symptoms, so that unless the heart happens to be examined the pericarditis might not be discovered. Usually this happens in severe cases which are approaching their termination, and in which the diagnosis of granular kidney has been already made, but the general symptoms may be relatively subordinate, and pericarditis be the prominent affection.

Although attended with so very few symptoms it is a very bad sign, and usually is the precursor of death ; or rather, to put it more accurately, the patient will die before long, even though the pericarditis may not be the actual cause of death, or indeed in some cases may have actually subsided.

As an illustration the following case is of interest.

CASE 11.—I was asked to see a gentleman in consultation, because he had suddenly developed pericarditis without any obvious cause. I found the patient in bed, well nourished and muscular, with a somewhat sallow, unhealthy complexion, looking not seriously ill. There was well-marked pericarditis, friction being unusually loud. His breath was slightly short, and his pulse a little hurried, but except for feeling generally ill he seemed to have nothing special to complain of. The urine contained a small amount of albumen, the arteries were thickened, and the tension raised.

The patient had been in perfect health until three weeks before I saw him. He had been hunting two or three times a week, and it was because he found he could not see the wire fences that he began to be uneasy about his eyesight, and this on one occasion caused him to get a fall. The eyesight gradually got worse, and it was this only which took him to the doctor. A week or so before I saw him his vision had become so considerably affected that he could not read at all; the pericarditis was discovered by accident, and he was then sent to bed, much against his will. Ophthalmoscopic examination showed the most extensive albuminuric retinitis, with numerous white patches in both eyes, and a few hæmorrhages ; the discs were greatly swollen, so that the condition fully explained the loss of sight. The breath was somewhat urinous; the quantity of urine passed was sufficient in amount, but the specific gravity was low.

A very grave prognosis was given, and in the course of a few days the patient died.

Now this patient had thought himself to be in perfect health, and was out hunting a month only before his death.

What has been said of pericarditis applies also to pleurisy, and sometimes the inflammation of both serous membranes is associated.

(*To be continued.*)

Malignant Adenoma of the Bed of the Thyroid.—W. Serenin ('Letopis Russk. Chirurgii ; Monattschr. f. Ohrenheilk., 1897, xxxi, 131). The author reports two cases, which were observed and operated on in the Marienhospital at Moscow. The cases were those of a young man eighteen years of age, and of his sister ten years old, both of whom presented in the interior and lateral regions of the throat, multiple button-like, elastic, and compressible tumours. These were extirpated, and proved to be adenomata of the thyroid gland, arising probably from accessory thyroid bodies. After extirpation they recurred. Finally, the author quotes the following points for a differential diagnosis in adenoma of the bed of the thyroid :

1. A tumour situated on the anterior portion of the neck, gradually enlarging.
2. Compressibility (depending on the venous geflechte surrounding the tumour).
3. Formation of nodules.
4. Adolescent age of patient.
5. Insufficient physical and mental development.
6. Family disposition.
7. Colloid degeneration of the nodules in the neighbourhood, and microscopical finding.
8. Recurrence.

Pediatrics, February, 1898.

ON THE TREATMENT OF UTERINE MYOMATA (FIBROIDS).

BY

J. BLAND SUTTON.

LECTURE III.—MYOMATA IN RELATION TO MENSTRUATION AND PREGNANCY.

THIS lecture will be devoted to the consideration in some detail of the perils which beset a patient when, with her uterus occupied by a myoma, she is, unfortunate enough to conceive.

This is a matter of deep importance, and as a preliminary it will be necessary to briefly review the relationship of menstruation and uterine myomata.

There is nothing in oncology better established than the fact that *all uterine myomata arise during the menstrual period of life.*

In Great Britain menstrual life covers an average of thirty years, from the fifteenth to the forty-fifth year. There is, however, no reliable record of a myoma being found in the uterus before the twentieth year. Several examples have been observed between the twentieth and twenty-fifth years. A case under my own care was in a woman in her twenty-third year. The physical signs indicated the presence of a pyosalpinx on the left side of the pelvis. The patient was kept under observation, but the swelling increased so much in size that it was deemed expedient to remove it. At the operation (June 15th, 1896) an ovoid myoma measuring 15 cm. in its major and 5 cm. in the minor axis was found springing from the side of the uterus, and separating the layers of the adjacent mesometrium. It was easily shelled out of its capsule. Eight months subsequent to the day of the operation she was delivered of a healthy, well-developed child, and as she remained in hospital until July 18th it is reasonably certain that she was pregnant at the date of the operation During the pregnancy the scar in the linea alba became deeply infiltrated with black pigment; but some months later the pigmentation had vanished, leaving the scar quite white. The tumour exhibited the microscopic characters of a hard myoma; it was examined with unusual care in order to ascertain if it supported Recklinghausen's view as

to the origin of some myomata from remnants of the mesonephric (Wolffian) duct.

Between twenty-five and thirty, myomata are fairly common, but the maximum of frequency is attained between the thirty-fifth and forty-fifth years (see table on p. 309).

Matthews Duncan pointed out that the interval between the twenty-fifth and the thirty-fifth years of a woman's life may be regarded as the great childbearing period, with an average length of twelve years. The menstrual epoch of a woman's life may be divided into three periods in relation to pregnancy and myomata, thus:

1. From fifteen to twenty-five, in which, assuming the environment to be favourable, a woman is infinitely more liable to conceive than to grow a myoma in the uterus.

2. From twenty-five to thirty-five; during this period her liability to pregnancy is greater than in the preceding period, but her liability to myoma is also greater.

3. From thirty-five to forty-five; in this the liability for conception is greatly diminished, but that for myomata is immensely increased.

It is not only true that myomata arise during menstrual life, but it is equally certain that they influence menstruation, and I have operated on many cases in which this disagreeable phenomenon has been as profuse between fifty and fifty-five as it was at twenty.

This fact does not in any way disturb the rule that when a woman with a myoma in her uterus obtains the menopause the tumour may cease to grow. That they disappear ("dry up" is an expression in common use) after the menopause is an event almost as rare as the advent of a comet.

Myomata sometimes take on an unusually rapid growth with the cessation of menstruation.

In 1890 a patient 48 years of age was placed under my care in the Middlesex Hospital for a myoma which had been detected nine years previously. Six months before her admission to the hospital she ceased to menstruate, then the tumour began rapidly to increase in size and interfere with the bowel, causing constipation alternating with diarrhœa. The tumour was removed by cœliotomy March 15th, 1890, and the pedicle treated by the intra-peritoneal method. The myoma was soft, and weighed 5 lbs.; it showed no signs of septic infection. The woman reported herself to be well

six years later. This case is of interest to me, as it was the first occasion in which I performed supra-vaginal hysterectomy by the method of ligature in the treatment of a myoma. At a consultation with my surgical colleagues I explained the method and duly carried it out. The patient made such a rapid recovery that she left the hospital eighteen days after the operation.

A second instance occurred in my practice, the patient being a married woman who had once miscarried. She came under my care with a very large myoma reaching as high as the navel. At that time I made an attempt to carry out oöphorectomy, but after removing the right ovary and

as much as ten years) the menstrual period of life, and it is worth noting that in this case the myoma was solitary and subserous,—a circumstance which has a very important bearing on the matter to be discussed in the next section.

Myomata and Pregnancy.

If Matthews Duncan's conclusion that the interval from twenty-five to thirty-five is the great childbearing period of a woman's life, it follows as a corollary to the three deductions in the preceding section, that when pregnancy and myoma co-exist, the subjects of such a combination should be women past thirty, and these should, as a rule,

Fig. 1.—A myomatous and pregnant uterus removed by supra-vaginal hysterectomy from a woman 44 years of age. The fœtus is of about 4½ months. (Museum of St. Bartholomew's Hospital.)

tube, failed to find the left ovary. Menstruation continued as usual till the forty-second year, when it suddenly and completely ceased, but the myoma grew steadily, and in 1896—five years after the oöphorectomy, and three years after the menopause—it became necessary to remove the tumour, which now reached to the diaphragm. It was a large sessile myoma seated on the fundus of the uterus. On section the tumour was white and tough in texture, like sponge. The patient is in good health at this date, 1898.

The fact in this case that menstruation ceased at forty-two in no way interferes with the working rule that myomata generally prolong (sometimes

be those who have either married late in life; or if married early, they remained many years sterile. The two facts may be stated with a fair amount of accuracy thus :

1. When the uterus of a parous woman begins to grow a myoma she usually ceases to conceive.

2. When a woman whose uterus contains a myoma conceives, this event is usually preceded by a long period of unfruitful wedlock.

An exception must be made of the solitary subserous myoma, as will be shown in describing the illustrative cases.

CASE 1.—A woman 44 years of age, who had lived in sterile wedlock fourteen years, was placed

under my care on account of an abdominal tumour which was not only rapidly increasing in size, but caused much pain..

My colleague, Mr. Andrew Clark, kindly operated on the patient, and found the uterus occupied by two large submucous myomata. He removed the uterus, and the patient made an excellent recovery. On examining the organ a fœtus of about four and a half months was found occupying the uterine cavity.

CASE 2.—In 1897 I saw in consultation a woman 40 years of age who had been married

tion, and she died three days later, the thirteenth after delivery.

Although submucous and intra-mural myomata hinder conception, it would be expected that a solitary subserous myoma would offer little or no hindrance to this process. This being the case, it would be expected that the co-existence of pregnancy and a subserous myoma would occur at an earlier period, and would not as a rule be preceded by a long period of sterility. The two following cases serve to illustrate this fact :

A lady 35 years of age conceived, and when the

Tube.   Placenta.   Amnion.

BERJEAU.
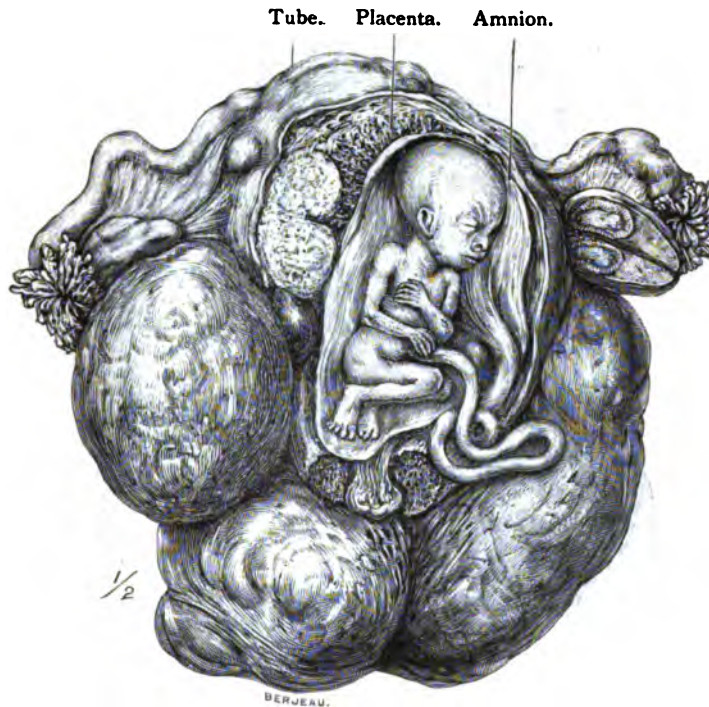
Fig. 2.—Myomatous and pregnant uterus removed from a single woman of 31 years. The operation was undertaken because the tumour had undergone rapid enlargement. The patient absolutely denied the probability of pregnancy. (Museum of St. Mary's Hospital.)

fourteen years ; ten days previously she had been delivered of a full-time child. Coincidently with the expulsion of the placenta an oval body, in shape like a fœtal head, presented at the os ; this was regarded at first as the head of a twin, but careful examination revealed some nodular outgrowths on the uterus. When I examined the patient there was no difficulty in deciding that a large submucous myoma had been partially extruded from the uterus, and had become septic. The patient was too ill to be submitted to opera-

pregnancy reached three and a half months such disturbance ensued as induced the doctor in charge to fear the existence of a tubal pregnancy. Luckily abortion occurred, and helped the diagnosis considerably ; it then became obvious that in addition to pregnancy the patient had either an ovarian tumour or a myoma. During the puerperium the symptoms caused such serious anxiety that on January 18th, 1895, I performed cœliotomy, and removed a large inflamed subserous myoma, but preserved the uterus, ovaries, and Fallopian tubes.

In April, 1897, she became the happy mother of a fine baby, a girl.

Of course these questions require to be tested by a larger series of cases than I have the leisure to collect and prepare; even the experience of a lifetime would not enable one man to adequately test the matter; but they may be sufficiently interesting to induce some one to make a collective inquiry on these lines.

In operating on some very large subserous myomata in women who have had children I have

I have added a table, consisting of fifty consecutive cases of uterine myoma which have come under my observation in hospital practice. In each instance an operation was necessary, so that the nature of the tumour rests on actual observation. The object of the table is to furnish facts as to the relative frequency of myomata in the two decades 25—35 and 35—45. I compiled a table very much longer with results nearly identical, but this short table will serve my purpose and be more convenient to the editor.

Fig. 3.—Pregnant uterus with a large subserous myoma, removed from a woman 31 years of age by Dr. W. Duncan. After the operation and before the uterus lost its tissue-life the anterior wall was cut away: in a few minutes, as the organ contracted, the fœtus and its membranes were extruded through the breach.

been astonished to find extensive omental adhesions, and have seen the epiploic arteries and veins connected with the adherent omentum and tumour forming extraordinary mixed retia, the arteries in some cases being as large as the radials. The formation of such adhesions I have usually regarded, perhaps erroneously, as a consequence of the pregnancy. In any case they greatly increase the operative risks, and therefore its dangers.

When a woman with a myomatous uterus conceives, it is certain that her life is in jeopardy, not only so long as the fœtus remains within it, but also when it is expelled, whether this occur prematurely or at the full time. The presence of the tumour not only leads to impaction, but tends to produce abortion; when this occurs the mother may die from hæmorrhage. A submucous myoma may become septic and slough. A subserous myoma

Age.	Civil State.	Nature of Tumour.	Parity.
23	M.	Subserous	1
29	S.	Intra-mural	1
30	M.	Submucous	2
30	M.	Multiple	0
30	S.	Subserous	0
31	M.	Submucous	0
32	S.	Multiple	Ab.
33	M.	Submucous	2 ab.
33	S.	Multiple	0
33	M.	Submucous	3 ab.
34	S.	Submucous	0
34	M.	Submucous	Ab.
35	M.	Cervical	0
35	M.	Submucous	4
35	M.	Submucous	0
36	M.	Cervical	0
37	M.	Multiple	0
37	S.	Cervical	0
37	M.	Submucous	1
38	M.	Cervical	2
39	S.	Submucous	0
39	S.	Subserous	0
39	M.	Subserous	4
40	M.	Submucous	3
40	M.	Submucous	2
41	M.	Intra-mural	0
41	M.	Submucous	0
41	S.	Intra-mural	0
42	M.	Submucous	2
43	S.	Multiple	0
43	S.	Subserous	0
43	S.	Multiple	0
43	M.	Cervical	2
44	S.	Subserous	0
44	M.	Cervical	0
44	M.	Multiple	0
44	M.	Cervical	0
44	M.	Submucous	6
45	S.	Multiple	0
45	M.	Subserous	Ab.
45	S.	Multiple	0
45	S.	Multiple	0
47	M.	Submucous	1
47	M.	Cervical	3
48	M.	Multiple	0
50	S.	Submucous	0
50	M.	Multiple	0
52	M.	Cervical	4
54	M.	Cervical	1
55	S.	Submucous	0

may become œdematous, and when the uterus empties itself the myoma may inflame and lead to peritonitis or the formation of dangerous adhesions. A cervix-myoma offers mechanical obstruction to the transit of the fœtus; a submucous myoma may be driven out in front of the presenting part; more frequently it is extruded subsequent to the delivery of the child. The complete extrusion of a myoma in this way usually requires from four to six weeks; the peril to life is so great that the majority of women who fall into such straits die unless the aid of surgery be enlisted.

When a woman has a tumour suspected to be a myoma, and there is reason to believe that it is rapidly increasing, it is worth while to remember—

1. *That she may have conceived, and the enlargement is due to the progress of the pregnancy.*

2. *The tumour may have become septic, or secondary changes may have led to the formation of cyst-like spaces.*

3. *The diagnosis may be erroneous, and the suspected myoma may be really an ovarian tumour.*

4. *Ovarian tumours and uterine myomata often co-exist.*

5. *An over-distended bladder has many times been mistaken for a rapidly growing pelvic tumour.*

Even this list does not exhaust the possibilities, for a *myomatous uterus may become impacted in consequence of conception, and when the impaction is relieved axial rotation may occur*, as the following case demonstrates :

A woman 30 years of age had married in October, 1897, and after missing three menstrual periods was seized, in January, 1898, with severe pain in the pelvis and retention of urine. Dr. Mills found a mass in the pelvis which he regarded as a retroverted gravid uterus. With the aid of anæsthesia he succeeded in pushing the mass out of the pelvis, but found a " swelling " had appeared in each iliac fossa. These " swellings " were very tender, and the patient complained of great pain. It was clear that either a myoma of the uterus or an ovarian tumour was complicating pregnancy. Prompt measures were taken for the relief of the patient, and next morning I performed cœliotomy, and found a large myoma growing from the posterior wall of the uterus; it was lying in the right iliac fossa, and a small one on the anterior wall occupied the left iliac fossa.

It will be seen on examining the drawing of the specimen (Fig. 4) that the total antero-posterior length of the uterus is 20 cm.—far too great a measurement to allow the uterus to occupy a normal position in the pelvis. It would appear that the myoma on the posterior wall of the uterus became impacted in the pelvis, as the uterus enlarged after conception, and at last induced

retention of urine by compressing the urethra. When Dr. Mills relieved the impaction axial rotation took place to the extent of a quarter of a circle, due to the myomata being accommodated in the iliac fossæ, hence the pain and acute suffer-ing which supervened on the relief of the impaction.

Supra-vaginal (conservative) hysterectomy was successfully carried out, the right ovary and tube being preserved.
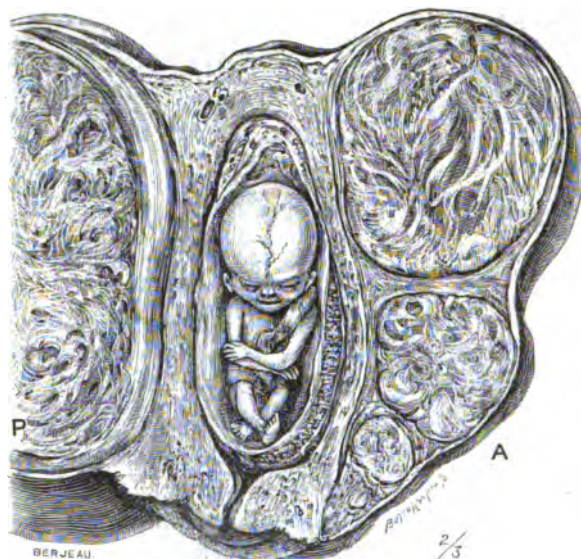
Fig. 4.—A myomatous gravid uterus in sagittal section. At the beginning of the third month impaction occurred; this was relieved, and as the uterus with its tumours was too long to lie in its natural position, axial rotation occurred. The antero-posterior length of the distorted organ was 20 cm. Only a portion of the large tumour is shown in the figure.

THE PREVENTION OF CINCHONISM.

From the *Therapeutic Gazette*, January, 1898.

WITHIN the last few years we have referred to the untoward effects produced by various drugs, and have called attention in particular to the disagreeable after-effects which often ensue when quinine is administered. With the more moderate of these effects nearly every one is familiar, for the laity often prescribe quinine for themselves in such large doses that they speedily experience the tinnitus, or deafness and headache, which full doses of this drug so readily produce. There are two ways in which these disagreeable symptoms may to a certain extent be modified by combining with the quinine other remedies. The oldest way, and the method which is perhaps resorted to most frequently, is the administration with each dose of quinine of five or ten grains of bromide of potassium or bromide of sodium, which seem, to a considerable extent, to modify the aural symptoms which we have mentioned. If the dose has been a very large one, and the patient is particularly susceptible to quinine, it may be well to give at the same time with the quinine a little fluid extract of ergot for its tonic effect upon the cerebral and meningeal blood-vessels. Another method for the prevention of cinchonism is that which has been suggested by Aubert within the last few months. He asserts that the administration of atropine in the dose of $\frac{1}{250}$ to $\frac{1}{150}$ of a grain with each dose of quinine greatly modifies the symptoms, and in those cases where the quinine was given for the relief of the neuralgia aided the quinine very materially in relieving the pain. It must be remembered, on the other hand, that in those who have a susceptibility to atropine, the dryness of the mouth and throat, and the disordered vision which may ensue after this dose of the drug might prove more uncomfortable to the patient than if the quinine had been administered alone.

A CASE

ILLUSTRATING THE DIFFICULTY OF DIAGNOSING ORGANIC FROM FUNCTIONAL DISEASE OF THE NERVOUS SYSTEM.

BY

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INTRODUCTION.

THE chief interest in the case which I am about to record is centred in the fact that at the outset it was difficult to be certain whether the only symptom present which pointed to derangement of the nervous system depended on structural damage to some part of this system, or whether it was only due to what we are in the habit of regarding as functional disturbance. The subsequent progress of the case was of equal interest in view of the fact that, although there was undoubted evidence present of structural damage to the spinal cord, there was nevertheless a large element of functional disturbance added to this.

I am induced to record the case because it presents many features that are most instructive from the point of view of diagnosis, and because in a considerable experience of diseases of the nervous system I have only met with two other cases that are strictly comparable to this one in regard to its clinical course.

My sincere thanks are due to Dr. Toye and Dr. Haynes, house physicians to the hospital, for taking careful clinical notes of the case, and for the care with which they watched its progress.

E. S—, female æt. 10 years, admitted into the Metropolitan Hospital on September 13th, 1897, under my colleague, Dr. Oswald Browne, who kindly transferred her to my care. On admission she complained of difficulty in walking. The history given by her mother was to the effect that the child was quite well until a fortnight before she was admitted into the hospital, when it was noticed that she walked in a peculiar manner—her mother's description of the peculiarity being that she walked " flat-footed." The patient was also said to have complained of pain in her limbs, which symptom had gradually become worse. Apart from being always tired, there was absolutely nothing else complained of, or noticed to be wrong. She had had no fits, had been sleeping fairly well, and had taken her food satisfactorily.

The history of her condition prior to the onset of the illness for which she was admitted into the hospital was that she was born at full time, and that no instruments were used to aid delivery. She was a healthy baby, and had at no time suffered from any convulsions. She had scarlet fever early, rheumatic fever two years before her present illness, at which time she was an in-patient of the Metropolitan Hospital for a period of six weeks. There was no history of chorea or any other disease of the nervous system, and she had always been intelligent.

Family history.—Her father and eight brothers and sisters are healthy, but her mother is the subject of bronchitis. The patient is the sixth child. There is no history of rheumatism, gout, phthisis, or of any disease of the nervous system in the family.

State on admission.—The patient was a healthy-looking, well-nourished, intelligent child. She made no complaint of headache or other pain. Her ocular movements were natural, and there was neither squint nor nystagmus ; the pupils were equal and reacted naturally, and the fundi were normal. The facial movements were equal on the two sides, and the tongue was protruded in the middle line. There was no defect of speech or articulation. The motor and sensory divisions of the fifth cranial nerves were intact, and hearing was preserved.

The neck muscles were natural, and the movements of the head on the trunk were executed normally and without tremor. There was likewise no sensory defect. The superior extremities presented no wasting, all the movements were normally performed without tremor or inco-ordination, and the grasps were good. The supinator and triceps jerks were not elicited. Sensibility was intact.

The trunk muscles were natural, and all the movements normally carried out. Sensibility was unimpaired.

The muscles of the inferior extremities showed no sign of atrophy. All the movements were

normally performed as the patient lay in bed, and there appeared to be no weakness. There was no spasm, contracture, or reflex jerkings of the limbs; the knee-jerks were more active than normal, but there was no ankle-clonus. Her gait was very unsteady, reeling being well marked, but she did not tend to fall always in the same direction. She brought her heels down to the ground very sharply, but did not raise the feet high in walking. There was inability to stand with the feet together and with her eyes closed. Sensibility was intact. She had perfect control over the sphincters, and the evacuations were passed naturally.

The heart's apex-beat was in the fifth intercostal space outside the nipple line. A systolic murmur was heard at the apex, and was conducted into the axilla. No pericardial rub or adventitious sound other than the systolic murmur could be heard. The lungs and the abdominal organs were also normal; her tongue clean, and the bowels regular. There was no pain or swelling of any of the joints. The temperature reached 101° F. the night corresponding to the day of her admission. There was no middle ear disease or other source of septic infection to be detected.

She remained much the same until the end of the month, except that the ataxia possibly became worse. Her gait was that of a drunken individual; she reeled first in one direction, then in another, and would fall if unsupported. She was kept at rest in bed, except that she was allowed to walk a short distance to and from the lavatory, and the nurses in charge of the ward volunteered the information that on such occasions she walked much better than when she was conscious that she was being observed. On ophthalmoscopic examination the fundi were found normal. The temperature came gradually down under the influence of salicylate of soda, until September 20th, when the evening temperature was normal. From this time to the end of the month, both morning and evening temperature remained about 99° F., with the exception of the evening of the 29th, when it reached 100·4° F. After this the patient became rapidly worse. The first change noted was that on getting her out of bed to test her walking she "flopped," her legs doubling up under her; and in spite of all encouragement she appeared to make ¬ effort to stand even when supported. On being

put back to bed it was found that she could execute all movements of both inferior extremities as she lay in the recumbent position, that no blunting of sensibility could be detected, that the knee-jerks remained active and equal as before, and that there was no ankle-clonus.

The next change noted was that although there was no blunting of sensibility, and the movements of the inferior extremities could be carried out in bed, the knee-jerks were no longer equal, this change being due to a marked diminution in the activity of the knee-jerk on one side.

The feature which next attracted attention was a progressive inability to move the limbs as she lay in bed, and a diminution of the more active knee-jerk as well as that which had commenced to fail earlier. In spite of these defects sensibility remained intact. The loss of motor power became rapidly worse, so that by October 10th she was unable to perform any movement of either inferior extremity; but on applying the faradic current to the toes and feet the patient moved the limbs in any direction she was told to, though most of the movements were performed slowly and with difficulty. The knee-jerks were becoming progressively diminished, and she then began to pass her urine under her, but sensibility remained unaltered. For some days prior to this the patient had been subject to attacks of urticaria, chiefly on the neck, trunk, and thighs.

The power of executing movements of the inferior extremities as she lay in bed improved by October 15th; but she was passing all her evacuations under her; cutaneous sensibility continued normal. Her condition remained much the same for the next few days, except that pricking the toes or feet with a pin induced the patient to perform voluntary movements of the inferior extremities, much as when the faradic current was employed with the same object in view.

About this time (October 20th) a zone of anæsthesia was detected about the level of the umbilicus, and there appeared to be some blunting of sensibility on the inferior extremities, but her replies could not be relied on. A tendency to the formation of small sores at the tip of the coccyx, between the folds of the nates, and on the heels occurred at this time. In addition to this, the temperature, which had been about 99° F., and sometimes 100° F., reached 101° F.

on the 16th and 17th, and the patient was losing weight.

By October 25th she had improved so as to move the inferior extremities more readily either when the battery or a pin was used to induce her to make the attempt. She, however, still continued to pass her evacuations under her. When attempts were being made to induce her to move her limbs she always passed urine into the bed, in spite of having failed to pass it when put on a bed-pan before she was tested. When placed on the bed-pan, when being tested she did not pass water in the way she invariably did if tested without the bed-pan.

Eleven days later she was unable to move her inferior extremities at all as she lay in bed, even when the feet were stimulated by a pin or the faradic current. The feet began to assume the position of equino-varus slightly, but could be easily returned to their normal positions on passive movement. The knee-jerks were quite absent, and the evacuations were passed under her. Five days later her condition remained much the same, except that she could perform some movements of the inferior extremities when the toes and feet were stimulated with the faradic current. At this time she was taken out of the hospital by her mother, contrary to my advice. Since the 17th the temperature had only been above 100° F. on two occasions, November 3rd and 4th ; otherwise it had been normal or subnormal most of the intervening time.

Throughout her stay in the hospital the child's manner was unnatural. She was sullen, could rarely be induced to answer questions in a voice louder than a whisper, and would never smile, even when attempts were made to amuse her. She was, however, more natural in her behaviour when other children went to her bedside and when she was not conscious of being observed by any of those in charge of her.

Remarks.—Several interesting points are worthy of discussion in this most instructive case, which, more especially in the earlier part of the time that it was under observation, supplied a diagnostic problem attended with no small amount of difficulty. When the patient first came into the hospital the only objective evidence of disturbance of the nervous system was a reeling gait, indistinguishable from that which characterises a lesion of the cerebellum. In addition to this, as we have seen, the temperature was raised.

Before attempting to discuss the neurological problem presented by the presence of the reeling gait, it will be well for us to consider the possible causes of the elevation of temperature. The history that the patient had complained of pains in the inferior extremities before admission, coupled with the knowledge that she had been the subject of an attack of rheumatism, with endocarditis, two years before, naturally suggested some rheumatic influence at work to account for the rise of temperature. There was, however, no pain complained of in any of the limbs after she came under observation, and all of the joints were free from swelling. So, too, in regard to her cardiac condition, apart from the systolic murmur heard at the apex, and present when the patient was in the hospital two years previously, there was no detectable evidence either of fresh endocarditis or of pericarditis. In spite of this, however, the fact that salicylate of soda appeared to control the temperature lent support to the possibility that the pyrexia was dependent on the presence of the rheumatic poison in the system. The only other cause that could be assigned for the pyrexia was the possibility that the lesion of the nervous system responsible for the reeling gait was inflammatory in character. Of this possibility we shall have to speak later, so that I propose to now discuss at some length the various phenomena present which pointed to an affection of the nervous system. The earliest of these was a reeling gait, such as is met with in connection with diseases of the cerebellum. The absence of headache, vomiting, and optic neuritis, as well as the absence of all symptoms characteristic of cerebellar disease other than the reeling gait, made it improbable that a tumour of the cerebellum could be responsible for this symptom. Similarly, the absence of these various symptoms, in conjunction with the absence of any evidence of suppuration of the middle ear or other source from which infection could be derived, made the presence of an abscess in the cerebellum equally improbable. The possibility of the case being one of Friedreich's hereditary ataxy naturally suggested itself, in spite of the history of a sudden onset two weeks before admission, as patients or their friends so often give a history that is misleading. We were, however, fortunate in being

able to check this history, as the patient had been in the hospital two years previously. On looking up the former notes of the case this possibility was at once put out of the question, as at that time no such evidence of defect of the nervous system existed ; in addition to which there was an absence of any other symptom of Friedreich's disease, nystagmus, lateral curvature, deformity of the feet, &c. The possibility of the occlusion of one of the larger cerebellar arteries by clot or vegetation, dislodged from the mitral valves and carried to the cerebellum in the blood-stream, was a possibility too remote to be seriously entertained, and there was no reason why a child of her age should get a hæmorrhage into the cerebellum.

Though other confirmatory evidence was wanting, less easy to exclude at first was the possibility that the case might be one of disseminated sclerosis, a disease which we now know may begin at a very early age, and of which no fewer than twenty-seven cases occurring in children have been collected from the literature on the subject ; but the absence of all other signs of this disease made this diagnosis improbable. So, too, it was possible that combined degeneration of the spinal cord, such as is met with in connection with anæmia, marasmus, and similar debilitated states of the system, might be in progress, as an ataxic gait is not unfrequently one of the earliest manifestations of such an affection. The absence of any detectable cause for such a combined degeneration of the cord, together with an entire absence of any other symptom of such a condition other than the ataxia, made this diagnosis equally improbable.

The testimony of the nurses in charge of the case that the patient walked much better when unobserved, as in going to and from the lavatory, of course suggested the possibility that the great simulator hysteria was responsible for the puzzle whose solution appeared so difficult. While the possibility was reasonable, I was loth to believe that this was the true explanation of the staggering gait. However, when the patient's condition reached the stage at which, while capable of performing all movements of the lower extremities as she lay in bed, she nevertheless "flopped" directly she was placed to stand on her feet, there seemed no longer room for doubt that, whether an organic basis was present or not, a large functional element must exist in the case.

That the affection could not be purely func-

tional, but that an organic substratum must exist, became more and more evident as the symptoms progressed, though the functional mask was never completely removed. The inequality of the knee-jerks, consequent on diminution of the jerk on one side, made the organic nature of the case almost certain, and the subsequent abolition, first of one and then of the other knee-jerk, left no room for doubt on this point.

Yet that a large functional element was added to the organic basis seemed none the less clear, from the fact that while there was a complete inability on the part of the patient to execute any movement of either extremity when told to make the attempt, she nevertheless immediately performed the movements if her toes or feet were pricked or touched with the faradic current. Certain as it was that the patient was the subject of grave organic disease of the spinal cord, had it been necessary for me to give a prognosis in the case at this stage I would have hesitated to give as gloomy an opinion as the facts seemed to warrant, for I had constantly before me the clinical histories of two cases closely similar to this one, which I saw several years ago, both of whom got quite well. One of the cases I refer to was more especially like this one, and, like her, the patient, a boy, for a long time passed all his evacuations under him as he lay in bed.

Having decided that beneath the functional exterior there existed an organic basis, it next became a question as to the nature of the morbid process, and here the existence of pyrexia without anything else to account for it lent support to the probability that the case was one of myelitis, the other possibility being that the paraplegia was the result of a tumour of the spinal cord. The fact that at one time the patient was unable to perform movements of the inferior extremities, while at another time she could, pointed to the possibility of interruption of conduction by pressure on the motor paths rather than by destruction of them. Such variability is seen in connection with tumours of the spinal cord and was strikingly illustrated by a case which was recently under my care, where under ordinary circumstances the patient was unable to perform certain movements of the inferior extremities, or was only able to execute them feebly, whereas when she chose to make an unusually powerful effort the increased amount of movement capable of being performed was sur-

prising. A feature of the power of performing movements in these cases, as contrasted with the case now under consideration, is that in cases like those of tumour of the cord the increased movement resulting on a great effort can only be executed once or twice. It is as if the paths along which the impulses have to pass at the seat of lesion become quickly fatigued, and no longer capable of conducting. In the case which forms the subject of this paper, on the other hand, the patient could never be induced to make an effort great enough to overcome the resistance at the point of block in the cord until a sensory stimulus was applied to the terminal portion of the limb. Two explanations of this are possible : the one is that the patient did not perform the movement before the application of the stimulus, as a consequence of the functional element which played so great a part in the manifestations of the disease ; and the other is a possibility suggested by the recent experimental investigations by Mr. Victor Horsley communicated to the Neurological Society in his Presidential Address on " The Degree of Discharge of Different Nerve Centres." Mr. Horsley finds that the amount of work that a muscle can perform, as measured by the height to which it is capable of lifting a weight, when the motor path above the spinal segment from which it is innervated is stimulated with the induced current, may be increased considerably by a certain method of procedure. Thus, using a muscle of one inferior extremity for the experiment, he finds that by first exciting the central end of the opposite sciatic nerve, he obtains a much greater effect on subsequent excitation of the motor path to the muscle above the spinal segment, from which the muscle is innervated, than was possible before the central end of the opposite sciatic was stimulated. In other words, impulses the result of the electrical excitation of the central end of the sciatic on reaching the segments of the spinal cord with which the fibres of this nerve are in connection, so raises the excitability of these segments or abolishes inhibitory impulses which may have been acting on them as to allow a greater degree of discharge to pass through them to reach the muscle than was previously possible. So closely do these experimental results correspond to what was met with clinically in my case, that it is reasonable to assume that the same explanation

may hold good in it also, and that the pricking of the feet, or application of the faradic current to them, resulted in a greater amount of movement following their use as a result of the afferent impulses thus generated reaching the spinal cord and raising its excitability, so that the same amount of voluntary effort made by the patient passes the block in the spinal cord more readily than it did before the excitability of the cord was thus raised.

Fascinating as is the latter of the two explanations, the former appears to me to be the more likely in this particular case, for the sensory stimulus was at times only slight and of almost momentary duration, after which the required movement was performed by the patient, so that it seemed hardly likely that it was sufficient to raise the excitability of the spinal cord.

It might be supposed that the movements evoked after application of the stimulus to the feet were either reflex, or the results of muscular contraction evoked directly by the current reaching and stimulating the nerves supplying the muscles which bring about the particular movements; but I abundantly satisfied myself that neither of these fallacies had crept into the observations. After the foot was pricked or stimulated with the faradic current, the patient began to draw the limb up slowly and gradually by an effort which was obviously voluntary ; and that the movement was not the result of the direct excitation of the muscles or their nerves by the induced current was clear, in that with one electrode at the lower part of the back and the other momentarily applied to the toes, the movement which could be elicited most commonly was that of drawing up of the leg by flexion at the hip and knee.

Difficult as was the diagnosis in the earlier stages of the disease, the later combination of symptoms, including loss of motor power of the inferior extremities, abolition of the knee-jerks, loss of control over the sphincters, and a tendency to trophic disturbances of the skin, left no room for doubt that we were dealing with an organic disease of the spinal cord ; and the facts at our disposal further pointed to the probability that the nature of the disease was myelitis. Whether this myelitis would lead directly to the patient's death, or whether it would become arrested and leave permanent paraplegia with loss of control over the sphincters, or whether it was of a peculiar kind, which, as in the

other two cases referred to in this paper, would eventually clear up and terminate in recovery, were problems on which no definite opinion could be expressed. The first possibility seemed the most likely; indeed, it seemed impossible that the case could terminate otherwise than unfavourably; nevertheless, as I have already said, so closely did the case resemble two other equally singular cases which terminated in recovery, that I found it difficult to dismiss the more favourable possibility entirely from my mind.

NOTES, ETC.

Complete Hepatoptosis may be caused by a diminution in the intestinal volume, by a lax belly wall, frequently post-puerperal, by an increased weight of the organ with atrophy of its environing connective tissue, and by congenital defects in its ligaments. It is frequently associated with floating kidney, intestinal ptosis, uterine displacements, hernias, and varicoceles. Partial hepatoptosis, floating lobe, is due to an hypertrophy induced by a dragging tumour of a neighbouring organ, which has become adherent to the liver, or to gall-bladder disease.

The chief symptoms are pain, tumour, and functional disturbances.

Complete hepatoptosis, according to Ferrier and Auvray, may first be treated by tonics, electricity, and pads; when these fail to ameliorate one should perform hepatopexy. The belly wall is incised, and the liver reduced and sutured to the right costal margin or to the abdominal wall with thick silk. Depage also excises portion of the abdominal parietes, both vertically and horizontally, to render them less lax. Peau, in 1896, in case of dislocation of the liver into the pelvis, separated a peritoneal flap from the anterior abdominal wall and sutured it to the post-parietal peritoneum beneath the liver. A floating lobe is resected, sutured to the parietes, or indirectly diminished by a cholecystotomy.

Revue de Chirurgie, Aug. and Sept., 1897.

A Manual of Obstetric Practice, for Students and Practitioners. By Professor A. Dührssen, M.D. Translated from the sixth edition by John W. Taylor, F.R.C.S., Surgeon to to the Women's Hospital, Birmingham, and Frederick Edge, M.D., F.R.C.S., Surgeon to the Women's Hospital, Wolverhampton.—London, H. K. Lewis, 1897. (Crown 8vo, pp. 322, 6s.)

A work that has already passed through six editions, and that has attained such popularity that it has been translated into English, not only because it will be acceptable to English students and practitioners, but also because it will tend to improve the quality of midwifery work, is certain of an immense success in this country. This book is assuredly remarkable in one way, and that is its size, for in 300 pages is contained a manual of obstetric practice; but putting aside the question of size altogether, the author and the translators must be congratulated on placing before the medical public one of the most useful manuals that have yet appeared. Much as one would like to enter into detail in regard to the excellence of this volume, still space must be found for a few words upon some slight imperfections which mar this otherwise brilliant work. The indexing should be improved in the next edition, and careful editing should result in the disappearance of a certain amount of repetition. It must be freely conceded that the author's views in their entirety are by no means universally accepted, but as a guide for diagnosis in difficult cases, and for treatment of obscure complications, no one could fail to derive useful help by consulting the views of Professor Dührssen as set forth in this volume.

Localisation of Headache and Sick Headache, indicating their Origin, Pathology, and Treatment. By H. Bendelack Hewetson, Hon. Ophthal. and Aur. Surg., Leeds General Infirmary. Pictorially illustrated.—Simpkin, Marshall, and Co., pp. 140, 8vo.

This work consists mainly of reprints of the author's work of thirteen years ago. In spite of this drawback, however, the reader of this small volume will find much to interest him in relation to the local causes of headache, and special praise must be given to the illustrations with which the book is freely furnished. Though for the reason just stated the book is not without many defects, still there is no doubt that to many it will be found serviceable in the treatment of the very troublesome affections described.

CONTENTS.

NOTICE.

TWO CLINICAL LECTURES

ON

DERMATO - NEUROSES, FROM A NEUROLOGICAL STANDPOINT;

INCLUDING CASES OF

Lesion of the Median Nerve, Hemiatrophy Facialis, Vesicular Eruptions, Skin Lesions in Hysterical Subjects, Prurigo, Chloasma, Wrinkles, Raynaud's Disease, Acroparæsthesia, and Fugitive Erythema.

BY

THOMAS D. SAVILL, M.D.Lond., D.P.H.Camb.

GENTLEMEN,—The subject of to-day's lecture is one of considerable interest, but unfortunately it is not such a simple one as would at first sight appear. You would imagine that, the skin being so accessible to view and to investigation, light would early be thrown upon this department of neurology. But it is not so; and we have few or no precise data from which to deduce general principles. The questions before us are, first, does the nervous system produce morbid effects in the skin? and secondly, if so, what are the effects produced, and what lesions produce them? In order to answer these questions, I propose to ask you to consider with me a series of cases of skin disease in which we have reason to believe that the primary cause is a lesion of some part of the nervous system.

These cases will be grouped into (a) those in which the lesion is situated *in the course of a peripheral nerve (sensory or mixed)*; (b) those where the lesion is probably situated in the *central nervous system* (brain or cord); (c) those where the lesion is to be found *at the end* of a centripetal or sensory nerve; and finally (d) those in which the mischief is located in some part of the *sympathetic nervous system*. Not a little difficulty arises from the fact that in each of these divisions the nerve lesions may be either *destructive* or *irritative*; and also from the fact that the effect on the skin

may be produced either in a *direct* manner by a centrifugal nerve impulse passing directly from the point of disease to the skin, or by a *reflex* method in which the nerve influence goes first to some centre, from which it is afterwards reflected to the skin.

(a) *Lesions of the peripheral nerves (sensory or mixed)*. I am extremely fortunate in being able to present to you a case, D. F—, which answers the first of our questions in a very definite manner, and affords valuable material for a reply to the second. This man is thirty years of age, and is now acting as a 'bus conductor. It is just ten years since he came under my care for one of the most severe attacks of tetanus that I have ever seen. Chloroform was administered, and he was rescued from the jaws of death by this and chloral hydrate, of which he took nearly 200 grains in twenty-four hours. From the point of view of cure by chloral hydrate the case is described in the 'Lancet' of November, 1888, but in one of the paroxysms, whilst he was under chloroform, I divided the median nerve (September 28th, 1887). The ends were loosely connected, remaining distant from each other about half an inch, by a piece of antiseptic catgut. It ought to be mentioned that this was before the time when the tetanus bacillus was known and identified, and when it was thought that division of the nerve trunk connected with the seat of injury was a legitimate procedure. He made a good recovery, and from the time of the operation the case may be divided into three periods : first, a period of about two months, when the median nerve was the seat of a destructive or paralytic lesion, when the ends were too far apart to unite; secondly, a period of about six months, when the nerve was the seat of an irritative lesion in attempted repair ; thirdly, a stage of complete repair and speedy restoration of functions.

On recovering from the tetanus it was, of course, found that he had paralysis of all the muscles, and anæsthesia of the skin supplied by the median nerve. The skin over the radial half of the arm and hand was more congested and perspired more readily than the ulnar half, but it was also smooth and glossy. The first and second fingers rapidly became thinner, showing atrophy of the tissues. The skin was thin, and the hairs on it ceased to

grow on that side of hand and arm. These were the symptoms of the paralytic stage, or stage of destructive lesion. These symptoms, it was thought, would pass away, but they did not, and at the beginning of the third month the irritative stage commenced. Dr. de Watteville, who kindly saw the case, quite agreed that the nerve was the seat of an irritative lesion, as evidenced by the muscular and electrical changes. The patient had neuralgic pains and tenderness along the course, and at certain points in the distribution of the nerve. There was a slight return of power, but a good deal of painful contraction of the muscles. As regards the skin, in the course of December vesicles appeared on the knuckles over the terminal joints of the index and second fingers without obvious cause. The skin over the radial half of the palm was redder and more wrinkled than that on the ulnar half, and it perspired much more readily. The vesicles continued to appear in crops during the ensuing six months. Various kinds of treatment were of no avail, and on June 8th, 1888 (eight months from the first operation), I cut down on the nerve and removed the growth which had formed at the original seat of division. A section of this is under the microscope, and you will see that the nerve fibres have attempted to reunite, but there is evidence of neuritis, and a large excess of interstitial tissue, so that the diameter is quite three times that of a normal median nerve. I removed this swelling, and brought the cut ends of the nerve close together by catgut sutures, and the patient made a good recovery. From the time of recovery the vesicles ceased to appear, the muscles gradually regained their volume, the skin became almost normal, and the sensation returned, so that he can now do everything with that hand excepting detect the difference between a shilling and a sixpence in his bag.

Here, then, is a case which answers in a clear and emphatic way the first of our two questions, and shows not only that nerve lesions can produce effects upon the skin, but also that a lesion of the same peripheral nerve, and in the same place, may be attended by very different symptoms according to whether it is destructive or irritative in its kind. Thus we see, firstly, that during the time the lesion was of a destructive or paralytic nature, it was attended by *smoothness* and shininess of

skin, and with *atrophy ;* and secondly, that the irritative lesion produced crops of *vesicles* as long as the irritation continued, together with a *wrinkled condition* of the skin in the area of distribution of the nerve. The redness and perspiration which were noticed in both stages, though more in the irritative stage, I take to be due to a loss of the central control over the vaso-motor nerves. Now, are the symptoms just named confirmed by other cases of paralytic and irritative peripheral nerve lesions respectively?

though he was "dazed" for a considerable time. He says he had slight pain in the face for a few days after this, but it was very transient, and he had no other symptoms until a couple of years later, when he found that he was gradually losing the hair from the left side of his head and his left eyebrow. You will observe that there is marked loss of the fat from the left orbit, so that the eye is sunken; and of the subcutaneous tissue of the left half of the face. The skin on this side is extremely smooth, thin (it seems about half the

Fig. 1.

Fig. 2.

Face of G. S—, æt. 44 (hemiatrophy facialis).—The side view shows well the marked atrophy in the position of the temporal and other muscles of mastication. The front view shows the atrophy of the subcutaneous tissue of the left side of the face and of the orbit, and also the baldness of the inner two thirds of the left eyebrow, and of the anterior part of the left half of the scalp.

The next case is one of *hemiatrophy facialis,* a rare condition, and still rarer when dating from an injury, as it does in this case. His name is G. S—, his age 44, and he is a waiter. Fifteen years ago he was running upstairs in a hurry, and struck the top of his head violently against a beam in the ceiling. He fell down, but does not think that he was quite unconscious,

thickness of that on the other side), and glossy, but not anæsthetic. There are various theories propounded for accounting for cases of hemiatrophy facialis, but that the condition is due to a destructive lesion of the fifth nerve in this case is evidenced, among other things, by the fact that there is distinct weakness and wasting of the muscles of mastication on the left side (Fig. 1, side

view). He suffered from slight neuralgia for a few days at the outset, but has had no pain ever since, and he has never had any vesicles,—*i. e.* he has throughout only manifested the symptoms of a destructive or paralytic lesion. The facial muscles are unaffected. The special senses and the other cranial nerves are also healthy. The palate and tongue appear normal. His only symptoms, as you can see for yourselves, are atrophy of the subcutaneous tissue and thinning, with a smooth glossy appearance of skin over the left side of the face, with complete loss of hair over the inner two-thirds of the left eyebrow and the anterior third of the left side of the scalp (Figs. 1 and 2).

This, gentlemen, is evidently a *paralytic* lesion of the trunk of the fifth nerve; and see what a marked contrast it presents with the next case that I am going to show you, which is, I believe, an example of an *irritative* lesion of the same nerve. It is that of a woman æt. 51, named M. J—, who three years ago was laid up with excruciating pain, which she locates very accurately in the region of the fifth nerve and its branches. I learn on good authority that it was also attended by a copious crop of herpes on the forehead, and severe inflammation of the left eye, which seems to have been of a most destructive nature, for the vitreous and cornea are opaque, and she is quite unable to see with that eye except light from darkness; in a word, she has had panophthalmitis in that eye. She has suffered from severe neuralgia on and off for the three years which have elapsed since then. But, gentlemen, you will notice that there is no atrophy of the skin on that side of the face, as in the other case. The skin is slightly red, and rough, which features offer a marked contrast to the atrophy and glossy skin in the other case, due to a *destructive* lesion.

Neuralgia, if it be a gross lesion of a nerve, which some deny,* must be regarded as an irritative lesion. In support of this you will remember that D. F— had no pain as long as the change was simply a destructive or paralytic one, but it was severe during the irritative stage. We are all familiar with cases of neuralgia where some of the hair becomes white and some of it falls out; and you will remember that neuralgia, other than hysterical, is often attended by herpes. But one

never sees in these cases the wide-spread atrophy of tissues such as occurs in destructive or paralytic lesions.

Glossy skin has long been attributed to trophic derangements of the nervous system in a general sort of way, but a study of these cases enables us to go two steps further. I could show you many other cases in support of my contentions. They all demonstrate that an actual gross lesion of a peripheral sensory, or mixed, nerve produces, in course of time, skin symptoms of a most pronounced kind; and these differ with the nature of the lesion. A destructive lesion will produce glossy skin; and also, if the lesion be severe and last long enough, extensive atrophy of the skin and its appendages. An irritative lesion in the same position will produce, though apparently in a shorter time, the opposite condition, viz. wrinkled or rough skin in the whole area of distribution; and vesicles will often appear in some parts of the area supplied by the irritated nerve. These latter symptoms are associated with neuralgic pain and tenderness along its course. The explanation of the smoothness and wrinkles respectively may perhaps be found in the paralysis or irritation of the involuntary muscular fibres in the cutis, though I hardly think this quite adequate. At any rate, gentlemen, here in the symptoms just referred to we certainly have some definite grounds to work upon.

Lesions of purely motor nerves are unattended by these symptoms; but in the case of a *mixed* nerve both destructive and irritative lesions may, as you know, be attended by atrophic flaccid paralysis of the muscles.

There is good reason to believe, though we cannot be quite so sure of this, that lesions situated in *any* part of the lower sensory neuron—that is to say, in the spinal cell of origin or any part of the course of a nerve—are attended by these same symptoms. There are also some grounds for believing that when an irritative lesion is situated in the spinal ganglion or the posterior horn of grey matter which contains the nerve-cells of origin (or neuron-bodies) of the sensory nerves, it will give rise to symptoms the same in kind but of greater severity and definiteness than when the lesion is situated in the course of the nerve, *i. e.* in the neuraxon. The perforating ulcers and some of the other trophic lesions that occur in *tabes dor-*

* Sir W. Gowers, for instance, regards it as a disturbance of the central cells.

salis are probably of this nature. Sherrington's [*]
and Batten's [†] recent researches have shown that
this disease begins in the muscle spindle, which
is the peripheral termination or arborisation of
the muscle-sense neuron. The marked sensory
disturbances which initiate this disorder render
it almost certain that the same change affects the
other sensory neurons. Now, although it is a
general law that the degeneration of a neuron
begins at the parts furthest from the neuron-
body or cell, nevertheless in time the neuraxon
and cell itself are finally involved, and as per-
forating ulcer is usually a late symptom in tabes,
it is probably due to the involvement of the cell,
or at any rate the sensory fibrils, in the degenera-
tive process.

(*b*) *Lesions in the central nervous system.*—
Passing next to the skin conditions due to lesions of
the brain, we have very few facts to go upon, and
I have only one case to show you to-day. Under
this heading would come the bedsores and trophic
lesions which occur on the paralysed side in cases
of *hemiplegia*, and it is worthy of note that these
skin lesions are more apt to form in cases when
the sensation is affected as well as motion, than
when motion alone is lost. Under the same head-
ing, too, would be included certain so-called
hysterical manifestations, of which the "œdème
bleu" of Charcot is one, and which I will refer
to again if time permit. Cases of various trophic
skin lesions, symmetrically distributed, believed to
be of an hysterical nature, have been described by
Fournier [‡] and others.[§] The case described by
Fournier consisted of a symmetrical vesiculo-
pustular eruption on the forearms and hands; and

[*] 'Journ. of Physiol.,' 1896-7.
[†] 'Brain,' 1897.
[‡] 'Nouvelle Iconographie,' 1892, p. 202.
[§] 'Obs. XI de la Thèse d'Athanasio. Des troubles
trophiques dans l'hystérie' Paris, 1890.
Kaposi, "Two Cases of Spontaneous Gangrene of the
Skin in Hysterical Subjects." 'Pathologie und Therapie des
Hautkrankheiten,' 3e éd., 1887, p. 378.
Ibid. "Ueber Zoster Gangrænosus Hystericus," 'Vier-
teljahrschrift für Dermatologie und Syphilis,' 1889, Heft 4.
'Obs. XXX de la Thèse de Leloir,' 1881. Gangrènes
multiples de la peau chez une jeune fille de 18 ans.
Sangster, "A Case of Supposed Neurotic Excoriation,"
'Medical Congress in London,' 1881, p. 184, vol. iii.
Renaut, "Sur une forme de la gangrène successive et
disomnie de la peau," 'La Médecine Moderne,' 20 février,
1890, No. 9, p. 161.
"Strumpell," Simulation. 'Ueber einen Fall von
schwerer Selbstbeschaedigung bei einer Hysterichen
Deutscher Zeitschrift für Nervenheilk.,' Bd. ii.

here is another case which somewhat resembles it,
a case full of interest and instruction. Amongst
other points of interest the case before you demon-
strates, in my belief, the close association which
exists between neuro-vascular conditions and
trophic skin conditions on the one hand, and
with the condition which we call hysteria on the
other. It forms the link, so to speak, between
two apparently widely different conditions. This
young woman, T. M—, is twenty-eight years
old, and is an assistant at a large draper's,
where her hands are much exposed. She has
never had chilblains on her feet, but has been
much troubled with them on her hands every
winter, from her sixteenth to twenty-fifth year.
Since that time, that is for the last three years, she
has through every winter been troubled with a
different form of eruption on the fingers and backs
of both hands. It consists of a constant succes-
sion of purulent vesicles. First there appears a
small round congested lump, like a chilblain, only
more circumscribed and round, and two or three
days later a vesicle forms on the top of this (such
as you can see on her middle finger), which rapidly
becomes purulent; and in the course of the next
two or three weeks gradually dries up and the
scabs fall off. A constant succession of these
lesions appears on the hands, very much like the
illustration of Professor Fournier's case, only they
are less regularly distributed. They itch a little,
but are unattended by pain or subjective sen-
sations. I was carefully removing one of these
the other day, without producing the least pain,
when a loud rumbling in her abdomen was heard,
and she promptly went off into a hysterical faint.
When she had recovered, I learned that she was
subject to two or three such attacks a week; that
she had always been very nervous; and that she
also suffered from frequent attacks of typical mi-
graine. These attacks are heralded by flashes of
light before the eyes, *pricking and numbness along
the ulna borders of the forearms and hands;* and
are followed by nausea, and sometimes vomiting.
Migraine is now very generally regarded as a vaso-
motor disorder: and that her vaso-motor system
is defective is evidenced, not only by all these
symptoms, but by the constant blueness of the
nose, on the tip of which, as one of you pointed
out to me is a small vesicle with purulent contents
like those on the hands. It would seem that we

have here a morbid state, which in ordinary people would remain simply as chilblains, but which in this girl has assumed the form of a trophic eruption. It is, if you will pardon so cumbersome a word, an angio-tropho-neurosis. Its symmetry points to a central nerve lesion, but the efferent impulses evidently pass through the sympathetic nervous system—the system which you have often heard me state is, in my belief, primarily deranged in hysteria.

Now, what features do the skin affections, due apparently to functional central nervous derangements, present in common? 1. In all those cases with which I have become acquainted they have been symmetrical and bilateral in their distribution, unless some local determining cause existed. 2. They mostly take the form of some variety of erythematous or vaso-motor condition, sometimes accompanied by vesicular manifestation, and sometimes, though less commonly, going on to actual necrosis. 3. They are unattended by acute pain, atrophy, or any of the other symptoms referred to under peripheral nerve-lesions; though they may give rise to pricking, itching, formication, &c., and be attended by those disagreeable somatic sensations which are hard to describe. 4. They are accompanied by other distinctly neurotic or hysterical manifestations of a general kind, and these frequently take the form of vaso-motor disturbances, e. g. flushing and shivering, "fainting," and the like. In a word, gentlemen, you will readily gather that it is through the sympathetic system that central, cerebral, lesions of a functional kind affect the skin. It seems very probable that central organic lesions act in a similar manner.

When we come to *diseases of the spinal cord* we have, perhaps, some more definite facts to go upon than in the case of the brain. We know, for instance, that certain cases of syringomyelia may present some very remarkable skin lesions, and my own belief is that that form of *sclerodermia* which affects solely or chiefly the ends of the limbs has an association of this sort. I have a case of that kind under treatment just now. She is a woman of thirty-five, and twelve to eighteen months ago she began to develop a harsh and stretched condition of the skin of the hands and forearms, feet, and legs. Shortly before that she had developed patches of sclerodermia (morphœa)

on the front of the abdomen and chest, over the ends, be it observed, of the intercostal nerves, in the same way as the skin of the hands and feet corresponds to the end of the nerves of the limbs. Lately she has shown some signs associated with syringomyelia, namely, atrophic paralysis of some of the muscles of the limbs. We are in a position of some difficulty here as regards the sensation, which cannot well be tested in sclerodermic skin, and the same as regards the temperature sense, which, as you know, is such a very distinctive feature of syringomyelia, but the sensation for touch is certainly less acute in some parts of her arms and legs than it is in others; whether this is due to the condition of the skin or not I cannot say.

In a case of *syringomyelia* who was under my care in the Paddington Infirmary in 1890, and who died when the gliomatous material reached the medulla, the history of the case was very typical, and we had the opportunity of verifying the diagnosis post mortem. Among other items of the case may be mentioned the fact that two of her fingers were anæsthetic, and the entire skin of these fingers was shed like the fingers of a glove on two occasions.

It is not possible in the present state of our knowledge to differentiate—as regards the skin—with certainty between an irritative and a destructive lesion of either the brain or the spinal cord. Nevertheless, one would be justified in believing that the differential facts which apply in the case of irritative or paralytic lesions of mixed nerve trunks respectively, would be applicable to corresponding lesions in the cord, for a peripheral nerve contains only part of the lower neuron. The neuron-body (cell), and remainder of the neuraxon, are to be found in the spinal cord.

NOTE.—The neuron has now come to be universally recognised as the anatomical and physiological unit of the nervous system, and is rapidly revolutionising our older conceptions of the nature of many nerve diseases. Some of the principal writers on the subject are the following:

Golgi (C.).—" Recherches sur l'histologie des centres nerveux," ' Arch. Ital. de Biologie,' iii and iv, 1882.

Waldeyer.—"Über einige neuere Forsehungen im Giebiete der Anatomie d. Centralnervensystems," ' Deutsche med. Woch.,' 1891.

Cajal (S. Ramon y).—" La fine structure des Centres Nerveux," ' Proc. Roy. Soc. Lond.,' 1894.

Schäfer.—" The Nerve-cell considered as a basis o Neurology," ' Brain,' xvi, 1893, p. 134.

(*To be concluded.*)

ON GRANULAR KIDNEY, AND WHY IT IS SO OFTEN OVERLOOKED.

ILLUSTRATED BY CASES.

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PART II.

General failure of nutrition.— Cardio-vascular changes such as described would naturally interfere considerably with the nutrition of the body. Patients with granular kidneys (cf. Case 1) are badly nourished; they are usually, but not always, thin, with a sallow, muddy complexion. In the later stages they find both their muscular and nervous energy greatly impaired, and it may be for this general sort of failure of nutrition that the patient may seek advice.

This constitutes a very common group of cases; the patients feel ill, but cannot say why they should fail prematurely in the way that they are doing.

Sometimes after seeking for symptoms they fix, it may be, upon the stomach, and complain of some trifling indigestion; upon the head, and complain of weariness and headache with any mental work, or upon the kidneys themselves, because they find they pass a certain amount of water, and have to get up at night. In fact, in men of the middle period of life, who complain of indefinite failure of health, the possibility of granular kidney should never be lost sight of.

In this connection the two cases which follow are of interest, and although each was complicated and not a simple case of granular kidney, the symptoms were not such as the other conditions would explain.

CASE 12.—Mary E—, æt. 38, a housewife, came to the hospital complaining of shortness of breath and some swelling of the feet.

For two years she had suffered from pain in the loins and lumbar region, with occasional œdema of the feet and puffiness of the eyes; this had been getting worse lately.

She had had three attacks of rheumatic fever at the ages of fifteen, twenty-seven, and thirty-four. She had four children alive, and the five last pregnancies had ended in miscarriages.

She was extremely anæmic and ill, had considerable œdema of the feet, and much albumen in the urine.

The apex was in the nipple line, and the cardiac dulness somewhat increased upwards and to the left; there was a systolic apex-murmur, but both sounds at the apex were audible. The arteries were very thick, although the tension was not high. There was some visible pulsation in the neck.

The anæmia was in excess of what could be accounted for by the amount of morbus cordis that she had, and the thickening of the arteries was such as is not met with in simple mitral disease.

When the eyes were examined well-marked albuminuric retinitis was found in both eyes; it was most marked in the left eye and in the neighbourhood of the yellow spot, there being a good deal of pigmentary change there with numerous white patches. The changes in the right eye were in an earlier stage. No defect of the sight had been complained of or existed.

CASE 13.—R. L—, æt. 33, a medical man, consulted me for gradual loss of strength and energy, which had been coming on for a period of twelve months. I had seen him previously as a student about twelve years before, in consequence of his having accidentally discovered a diastolic aortic murmur in himself. This he certainly had, but it had produced no symptoms, and he remained well until 1892, the year before I saw him again.

In November, 1892, he had an attack of some indefinite kind, of which I could not get a complete account, in which the temperature was raised to 104° for several days; he was very ill, and passed black urine. After a few weeks he got well enough to go abroad, and spent the next three months in Italy and Egypt. On his way home, in March, 1893, he had an attack of collapse and fainting in Rome. A little later he had another attack. He felt extremely weak and fit for nothing; had tingling in the arms and legs, and some difficulty in speaking distinctly. He felt extremely unwell and unfit for any fatigue, and remained in bed for three weeks. The urine at that time contained a considerable amount of blood, varying in quantity from time to time. He shortly after became very drowsy, almost bordering on coma, and had twitchings in the arms and legs. It was nearly a month before it was safe to move him home. The urine was examined frequently, and was found to contain blood in varying quantities on several occasions. Granular casts and a few hyaline casts as well as blood-casts were also seen at first, but these soon disappeared. There was a certain amount of albumen, not a large amount; the reaction acid, sp. gr. 1015, and the quantity about 50 oz. in the twenty-four hours.

Four months later I saw him again. He had been gradually getting better, but was still feeling extremely weak, and unfit for any work. He looked very pale, somewhat sallow and feeble, but not thin. The heart had hardly changed from the time when I saw him first; the apex was just in the nipple line, the murmur was still distinct, but the pulse was not characteristic of aortic disease. The arteries were somewhat thickened, and the tension slightly raised. The urine was from 80 to 100 oz. daily, and contained a trace of albumen.

The history he gave of the frequent passing of blood—the urine on many occasions being black in colour—

suggested the diagnosis of paroxysmal hæmoglobinuria, but there is no doubt that it was one of those instances of hæmorrhage in granular kidney to which I have already referred; but it was peculiar in this respect that the blood was dark, and not, as it usually is, bright in colour. There was no reason to associate his symptoms with the affection of his heart, which seemed an accidental complication, and one which had little to do with his present illness.

He went to Egypt, where he spent six months of the later period of each year. About two years later he came home, and shortly after his return was seized with an attack of a somewhat similar kind to that from which he suffered in November, 1892, passed into a condition of unconsciousness with twitchings, and finally died with uræmia.

Sometimes it is for **dyspeptic symptoms** that the patients come under observation, both stomach and intestinal. Thus the patients may complain of dyspepsia or sometimes of acute attacks of gastric pain, almost neuralgic in character, of recurrent vomiting, of irregularity of the bowels, and sometimes of attacks of almost uncontrollable diarrhœa.

Perhaps in connection with these dyspeptic symptoms it will be fair to place *cramps*, which are so common in connection with the dyspeptic attacks of adults.

Case 14.—James C—, æt. 41, a coach painter, came to the hospital complaining of attacks of cramp in his calves from time to time, and of occasional morning sickness. His sight had been misty during the last six weeks, and during this period he had suffered with severe frontal headache. He had had lead colic several times, for which he had twice been an in-patient in the hospital, and had also had several attacks of gout. The urine was increased in quantity, and he had to rise once or twice each night. The specific gravity was 1010, and it contained about one sixth of albumen. The artery was thick, but the tension low; the heart presented no definite physical signs of hypertrophy. On examination of the eye, the condition of the left disc was a little indefinite; it was thought to be possibly an imperfect development of the optic nerve. The disc on the right side was also not quite normal, but it might have been a similar condition less developed. However, three weeks later, on examining the eye again, a few recent hæmorrhages were found in the right retina, with some minute and somewhat indistinct white patches in the neighbourhood of the yellow spot. The left disc was somewhat obscure and difficult to see, but there did not appear to be any white patches in that eye.

Case 15.—Another case of the same kind occurred in a man of the age of 52, a glass-cutter. His work was to cut glass which was backed with a preparation of lead, and was used for the common looking-glasses and Chappuis reflectors. This had been his occupation all his life. He had had gout since the age of 22; had had many attacks of lead colic, and came under treatment for an attack of this kind. He had had many attacks of gout, and had large gouty deposits in the bursæ of his elbows and fingers.

He was anæmic, sallow, with a well-marked blue line on the gums. He presented the signs of granular kidney, viz. thickened arteries, hypertrophied heart, a good deal of albumen in the urine, and, in addition to that, wellmarked albuminuric retinitis of the most typical kind, with numerous white patches round the yellow spot. What brought the patient to the hospital, besides the cramp, was the recent gradual failure of vision and severe frontal headache. The frontal headache ultimately became the most prominent symptom. It apparently was agonising and of a violent neuralgic character, and though relieved temporarily by phenacetine and similar drugs, was most benefited by persistent administration of small doses of nitrate of pilocarpine.

In the following case *uncontrollable diarrhœa* occurred, and at post-mortem nothing was found but granular kidney.

Case 16.—The patient was a man of 42, who had lived in Singapore for many years, and there had various illnesses and some attacks of fever. He was a heavy drinker, but did not seem materially to have suffered from it. He came home on leave; and while away on a short holiday from London he was seized with very troublesome diarrhœa, and came back. From that time till his death he was afflicted with the most profuse, uncontrollable diarrhœa, in some cases twelve or fifteen copious motions in the twenty-four hours.

The patient was a spare man with a somewhat earthy complexion, and looked as though he might have been a fairly hard drinker, as in fact he had been.

He lay throughout in a listless, apathetic condition, not actually delirious, but taking little notice of what was going on around him. His pulse was 102, the tension a little above normal, but the artery not markedly thickened. There was a good deal of tremulousness about his movements, especially in the face, hands, and tongue. The urine contained a little albumen, and for the first day or two a few granular casts, which, however, were not found subsequently. The liver was slightly enlarged, extending about three quarters of an inch below the costal arch in front.

Having an obscure illness to deal with in a patient returned from the tropics, the blood and fæces were carefully examined to see if any information could be obtained from them, but none was forthcoming.

The temperature, though raised to 101·4° at the commencement of his illness, soon fell, and for the latter part of the time was below normal.

In the fourth week of his illness an erythematous rash appeared on his trunk, and rapidly spread over the whole of his body. It itched a great deal, and subsequently peeled. The diarrhœa continued, and treatment had little or no effect upon it. The patient became weaker and weaker, and ultimately died, after about six weeks' illness.

On the post-mortem examination nothing was found except granular kidneys, and that not to a very advanced degree. The liver was a little enlarged, and weighed 54 oz. The kidneys weighed 14 oz. together; they were red on section, the surface slightly granular, and the capsule a little adherent. The eyes showed no lesion.

The preceding case leads naturally to the consideration of another group of cases in granular kidney, the importance of which, I think, is not fully recognised. I refer to more or less **acute general skin eruptions.** Their clinical importance lies in this,—that when there is a generalised skin eruption, especially if it be of an acute character and albumen be present in the urine, and especially if there be the other signs which would indicate the presence of granular kidney, the prognosis is very grave, for most of the cases terminate fatally. This is so striking that whenever I see a case of generalised skin eruption of a more or less acute character I inquire naturally whether there is albumen in the urine ; if so the case assumes to my mind a more than usual gravity, and if the signs of granular kidney be present too, I feel compelled to express a serious view as to the prognosis. I cannot do better than illustrate this by a complete account of a case which has been recently under my care.

CASE 17.—William S—, æt. 48, a cook, was admitted into the hospital with a universal exfoliating dermatitis. He stated that he had been quite well until the week before Christmas, when he noticed itching of the feet and scrotum, and about the same time two blisters appeared on the palm of the hand, so that he could no longer hold anything comfortably ; at the same time he cut the back of his hand, and this never properly healed. Shortly after the irritation about the penis and scrotum became intolerable, and kept him awake at night. The itching gradually extended over the whole body.

At the end of January the skin began to scale and peel off, and in the beginning of March the face began to share in the general eruption, and also the scalp, from which the hair began to come off. The eyebrows and eyelashes also fell out, and there was a good deal of swelling of the face, so that in the morning he found it difficult sometimes to open the eyes.

During the last fortnight there had been in places a few blebs, and after these had burst the skin had peeled off in larger flakes. He stated that he had been perfectly well all his life up to the time of the development of this rash. Except for the skin affection, the patient would appear to be a healthy man, and did not look his age. The eruption was of the nature of an erythema, with a good deal of desquamation in places. In parts where the folds of the skin are in contact there was an eczematous condition. Over the whole body there was a good deal of subcutaneous infiltration, and the lower part of the legs and feet pitted on pressure. The whole of the body was covered with fine branny scales, which did not readily rub off, but where they had been removed the skin beneath was glossy and parchment-like. The parts that were eczematous were the ear, especially at the back, the scrotum, penis, and insides of the thighs, and some few parts of the body. The face was

greatly swollen, and of a vivid red colour. The eyelashes were short and stubbly, and of the eyebrows but a few scattered bristles remained. The eyelids were œdematous, and there was some conjunctivitis and lachrymation. The scalp was full of dry scales, and the hair dry and lustreless. The desquamation, which was general, was more marked over the trunk and lower part of the abdomen, and on the thighs the patches came off in large flakes. On the sole of the foot the skin seemed almost raw. The urine was 1010 specific gravity, and contained a thick cloud of albumen. The arteries were somewhat thickened, and the tension high. All the other functions seemed to be performed satisfactorily, and the temperature was normal.

The patient was treated with simple bathing and inunction of carbolated oil, and a few days later was given baths of sulphide of potassium, in the strength of about 15 grs. to the ounce. This was followed by a good deal of general improvement in the condition of the skin and in the comfort of the patient.

About a month later the patient complained of numbness in both legs, and some feeling of stiffness. It was then found that the knee-jerks could not be any longer obtained.

On March 21st the temperature rose to 102·2°, and boils developed on the left cheek below the eye. These developed into small carbuncles, and discharged very freely ; with the discharge the temperature fell to normal.

In general condition the patient remained much the same until about the 26th April, when he became very excited and emotional at night, and had to have a composing draught given him, after which he went to sleep, and he remained very drowsy all the day following, muttering to himself. His temperature rose to about 100·6° ; his tongue became brown, furred, and cracked ; he was thirsty, and a considerable quantity of albumen was found in the urine, the specific gravity being 1009. He became also very tremulous and feeble, and began to have some difficulty in passing water, so that it had to be drawn off with the catheter two or three times a day, the total amount being fairly large, about 80 oz.

On the 28th he became still more drowsy and dull, groaned continuously, and muttered unintelligibly. On the 29th he was worse, and had a good deal of twitching of the muscles, the breathing became noisy, and the breath had a urinous odour ; and on the 29th at midday he had a fit, and two more later in the course of the evening. They were of a uræmic character, and after the last he died, apparently in a uræmic state.

Post-mortem examination.—Besides the exfoliative dermatitis and some carbuncles,—on the left cheek, a few small ones on the neck, and one on the left wrist,—the following changes were observed :

Both lungs were emphysematous, and the left pleura universally adherent. The heart weighed 12 oz., was fatty, very friable, the valves natural ; considerable hypertrophy of the left ventricle, and some hypertrophy and dilatation of the right side ; some atheroma in the upper part of the interventricular septum, and also in the vessels, especially in the arch of the aorta. The spleen weighed 9 oz., and the capsule was somewhat thickened in patches. The kidneys weighed together only 3½ oz.; the right was somewhat larger than the left ; both were extremely small,

the capsule adherent, and also the perirenal fat; the surface pale and granular some large cysts on section. There appeared to be hardly any natural kidney substance left, but an irregularly striated, fibrous stroma, pale rather than red.

I have seen a series of these skin cases associated with chronic kidney disease, which I intend soon to record. The character of the eruption has varied considerably: for the most part the rashes are of the nature of erythema, which is followed by desquamation. In some of them the desquamation has been so free that they might be called pityriasis rubra or dermatitis exfoliativa.

CASE 18.—In one case, that of a man of about 40, the skin was covered with small papules of varying size, somewhat like chronic urticaria. The case occurred during an epidemic of smallpox, and as the patient had a papular eruption with a rise of temperature, the diagnosis was a matter of some importance.

This patient also died, and granular kidneys were found post mortem.

We have no means of determining whether the granular kidney causes the rashes or not. It may have been that the rashes were accidents, and that the serious results depend upon the patient having granular kidneys. Whatever the relation of the two affections may be, their association is important on account of the frequently fatal result.

I now pass on to a group of cases in which **nervous symptoms** have been the first to bring the patient under medical observation.

I have already spoken of *apoplexy* when considering the hæmorrhagic group.

The most striking of these nervous cases are those in which *failure of vision* is the first symptom of which the patient complains. Of this Case 8, already referred to when speaking of pericarditis, is a very striking instance.

The failure of vision is in most cases associated with very obvious changes in the retina—those of albuminuric retinitis, which cannot be overlooked if the eyes are properly examined. Considering the extensive changes which are often seen in the eye, it is not surprising that the sight should fail; it is more extraordinary that the sight should remain so long unimpaired, as it often does. In many of the cases already quoted, where other symptoms led the patient to seek advice, the albuminuric retinitis was well marked although there had been no eye symptoms. When the

eyesight begins to fail in these cases it may fail very rapidly, so that, as in Case 8, in a week or two the patient may become almost blind.

One remarkable point in connection with albuminuric retinitis is, that it is at the time of its discovery almost invariably bilateral. Of course, it is almost certain that one eye begins to be affected before the other, but the other follows suit very soon after. Indeed, I have seen only one case in which there was what we may call unilateral albuminuric retinitis, in which the changes were well marked in the one eye and absent in the other; but I have also seen one other in which in the second eye the changes were so slight as to be only detected on very careful examination.

There is another group of cases in which with granular kidney there is failure of vision without any ophthalmoscopic changes to explain the defect. I am referring at this moment to those cases in which the failure of vision is permanent, not to those in which there is temporary loss of sight, and which have commonly been referred to passing spasm of the vessels, or to some toxic effect in the course of uræmia.

Headache and *giddiness* sometimes are the first symptoms which bring the patient to the doctor, and when these symptoms are also associated with optic neuritis the resemblance to cerebral tumour becomes very close.

CASES 19, 20.—Some years ago I published two cases of this kind in which the symptoms seemed to point to cerebral tumour. One occurred in a girl of 18, and another in a woman of 50. Both, in addition to these signs, were subject to sickness, especially on rising in the morning. In the case of the young girl the question of pregnancy was raised, although there was no other reason to suspect it. In the other case, the patient being past the climacteric, that question could not arise. Both proved to be cases of granular kidney, and presented typical albuminuric retinitis.

Headache is a very common and prominent early symptom; it is often of a neuralgic character, occurring in the most intense paroxysms, and is occasionally diagnosed as hemicrania,—that is to say, that its association with granular kidney is overlooked. The following two cases are good instances of this.

CASE 21.—George B—, æt. 25, came to the hospital complaining of severe frontal headache and attacks of cramp from time to time, especially on rising in the morning. These symptoms had existed on and off for a

period of about two years, and during this time he had also suffered a good deal from pain after food, with occasional vomiting. A short time ago his legs had been slightly swollen once or twice, but that had passed off. Micturition had been frequent; he had a considerable difficulty to hold the water during the daytime, and had to rise two or three times each night.

The artery was thick, the tension high; the urine contained one eighth albumen, and was of low specific gravity. His chief present trouble besides his headache and cramps was thirst and dyspepsia.

CASE 22.—George B—, æt. 58, a ship's carpenter, had been in active work and, as he thought, in fair health until the last two months, when he began to lose strength and to feel ailing. He suffered occasionally from headache and from giddiness. What brought him to the hospital was some trouble with the digestion.

He was a thin man, with a sallow, earthy complexion, some emphysema of the lungs, and some hypertrophy of the heart, the apex beat being in the seventh space, and the left ventricle obviously dilated, the artery thickened, the tension low, and the pulse beat somewhat irregular and deficient in force. The urine had sp. gr. 1016, and contained a trace of albumen. He was not troubled with frequent micturition.

I have seen one case in which the symptoms were those of *peripheral neuritis*. The following is a short abstract of a case which is interesting in this connection.

CASE 23.—A young man æt. 27 came under my care with the signs of peripheral neuritis, both his arms and legs being affected. Shortly afterwards he developed œdema and a good deal of albuminuria, the symptoms being apparently those of acute nephritis. He recovered from both his peripheral neuritis and most of his symptoms of nephritis, but he was left with a small amount of albumen. His arteries were a little thick, and during his convalescence he developed slight optic neuritis; but this passed off, and he was dismissed from the hospital fairly well, except for the small amount of albumen present. He remained, as it was thought, in fair health until a few months later, when he fell down in a fit in the street, and was picked up and taken into St. George's Hospital, where he died. There was, unfortunately, no post-mortem examination, so that the diagnosis is not quite certain, but I thought it a case of granular kidney. It is interesting to add that a brother of his died about the same time with kidney symptoms; and one of his sisters also was brought to me with persistent albuminuria.

The next case is one which, though presenting some signs of peripheral nerve disturbance, in some respects resembled a case of *locomotor ataxia*.

CASE 24.—Richard H—, æt. 50, a warehouseman, came to the hospital complaining of numbness and tingling in the fingers of his right hand; this he had experienced for about a month, but during the last week he had similar sensations in the right leg, with occasional sharp pains starting from the back and shooting down the leg. With this leg he feels as if he were "walking on nothing." There was no loss of power or wasting in either leg, and no impairment of sensation; the knee-jerks were a little increased on both sides, and ankle-clonus was present on the right side.

The patient was a little unsteady when standing with the eyes closed and the feet together. There was also slight nystagmus, but no pupil changes. With these exceptions the patient presented nothing definite except the signs of granular kidney; for he had a thick artery, a high tension pulse, and a somewhat hypertrophied heart, and he was of a cachectic, earthy complexion.

The urine contained a small amount of albumen, and was of low specific gravity.

In the following case the granular kidney was *associated with gout and lead poisoning* (cf. Cases 14 and 15).

CASE 25.—A man æt. 47 came to the hospital complaining of weakness in the right wrist. He had some loss of extension, and the two middle fingers dropped entirely, the index and little finger, however, being still partially extended. It was evidently a case of slight lead poisoning, and there was a faint lead line over some of the teeth. The man was a carpenter in some lead works, and had occasionally had attacks of colic.

He looked pale, thin, and had been complaining lately of some swelling over the right wrist, and also the right great toe, not of a very painful character, but evidently of the nature of gout. On examining his pulse his artery was found very much thickened and the tension high; the heart somewhat hypertrophied; the first apex sound prolonged, and the second aortic sound accentuated. The urine was of low specific gravity, with about a quarter albumen; the eyes were examined, but no albuminuric retinitis found. In this case it was clear the patient had lead poisoning and gout; but it was also evident directly the finger was placed upon the pulse that he was suffering from something more serious than either, viz. granular kidney.

The association of these three diseases is of course well known, and is remarkable, but what the real relation between them is has not yet been established.

I now come to what is perhaps the most interesting group of cases, viz. those which belong to the category of *uræmia*. What the exact pathology of uræmia is we do not know, except that it is a toxic condition, and might be better called renal toxæmia. It may occur in acute and chronic forms, and the one often passes into the other.

Of the symptoms of *chronic renal toxæmia* the commonest, perhaps, is that of headache. It is often paroxysmal and neuralgic in character, and very like hemicrania, and may be so intense as to render life intolerable. The recognition that this headache depends upon the kidney, influences to

some extent the treatment, and for these cases I know nothing that gives the same marked relief as nitrate of pilocarpine. As symptoms of chronic toxæmia we may regard many of the symptoms already referred to, *e. g.* the general failure of nutrition and loss of flesh, much of the dyspepsia, the attacks of obstinate vomiting, renal inadequacy, and diarrhœa, as well as the violent headaches, cramps, and peripheral nerve affections which have been already referred to.

We may refer also to this cause some of those curious attacks of cerebral excitement, which in their extreme form may be called mania. I have seen granular kidney end with such symptoms in many cases. Generally the attacks of excitement come and go, and are not continuous, but I have known them to become so frequent as to be practically continuous for some weeks together, so that the patient has been regarded as a maniac for the last few weeks of life.

Other symptoms which are sometimes associated with uræmia are the temporary losses of vision, which have been already referred to, some of the attacks of dyspnœa, which have been called renal asthma, and possibly also Cheyne-Stokes breathing; the latter two affections are, however, in the majority of cases of cardiac rather than nervous origin.

Of *acute renal toxæmia*—that is, of uræmia as we commonly understand the term,—I need not say much, for it is with uræmia that so many cases of granular kidney suddenly end. The onset of the uræmic attacks may be the first grave symptom of the disease from which the patient is suffering. Thus it is not at all uncommon in hospitals to find patients brought in unconscious, and dying without the diagnosis being certain till after the autopsy, whether it was uræmia, epilepsy, or cerebral hæmorrhage that caused the symptoms, so suddenly may the attack come on and end, and so little clue may the patient's symptoms give as to the real cause and nature of this disease.

In this connection the following case is of very great interest, for the attack was like one of apoplexy, though it proved ultimately to be uræmia. What is still more remarkable is that this patient recovered completely, and has been since at his usual work and in his usual health up to the present time, some months now after the attack. Such a result, it is hardly necessary to state, is extremely rare.

CASE 26.—Samuel C—, æt. 43, a well-built and fairly healthy-looking man, was in good health and able to follow his usual occupation until the 1st of May. He then complained of feeling unwell, but of nothing definite; asked for food, but could not eat it; was extremely irritable, and his arms trembled a little. The next day he became somewhat rambling in talk, and by the evening was unconscious. He was brought to the hospital in this condition and admitted as a case of apoplexy. The patient was quite unconscious, the face somewhat blue, the breathing stertorous, and the cheeks puffed out on expiration. The eyes and head had a tendency to turn to the right, but the legs and arms were both moved from time to time, so that the patient was not paralysed. The plantar and tendon reflexes were present on both sides. The arteries were thickened, tension high, pulse 120; there were slight traces of albumen in the urine, specific gravity 1020; the left ventricle was a little hypertrophied, the apex being in the nipple line. With these exceptions there was nothing to be discovered. The patient was treated in the usual way. In the evening it was thought the patient might be relieved by venesection, and accordingly about 20 oz. of blood were removed from the left arm; 5 grs. of calomel were also given as a purge.

The temperature on admission was 100·6°, falling that evening to below normal. During the night the patient was very restless and continually groaning, and in the early morning of May 4th he became somewhat quieter, but was still unconscious, and shortly afterwards had five fits, each lasting about three minutes, and confined to the left side. The temperature during the night rose to 104·2°, but fell again in the course of the day to normal.

On May 5th the temperature, which had risen in the latter part of the preceding evening to 102°, was found to be normal, and from this time did not rise again. Breathing was quieter, and the patient now began to speak a little, and seemed to recognise his wife. He passed a fair amount of urine, which contained, as before, a small amount of albumen.

On the 6th he was better until the evening, when he became somewhat wandering, and was very restless. From this time he began gradually to improve, though for the first few days the improvement was slow.

On the 11th of May the patient, who had previously been taking hydrate of chloral and bromide, was now put upon nitrate of pilocarpine, one sixth of a grain three times a day. From this time he rapidly improved, and on the 23rd was discharged well. He has been seen several times since, and continues well; and though obviously the victim of granular kidney, has now no symptoms to trouble him.

This case shows that the acute uræmia of granular kidney may be recovered from just as that of acute nephritis, but it is hardly necessary to add that recovery is much less frequent, for in most cases of granular kidney uræmia leads to death in a few hours, or at the most a few days.

I think I have clearly shown from the cases

which I have quoted from my own note-books—and they might very easily have been multiplied—how indefinite, miscellaneous, and misleading the symptoms of granular kidney may be, how long the disease may go on without any definite symptoms at all, and how easy it therefore is for granular kidney to be overlooked.

The fact is being constantly brought home to me that granular kidney is a much more common disease than is popularly supposed, especially among the young. Of the disease itself there is still a great deal to be learnt, and we know but little of its early beginnings; yet it is only by diagnosing the condition early, and watching it through to the end, that some idea can be gained of what the natural course of the disease is. There are good grounds, as I have already said, for believing that granular kidney begins very much earlier in life than is commonly taught. Though we must admit that treatment can do little to cure the well-established disease, still it does not follow that a great deal more could not be done, if the disease were recognised in its early stages, either to delay its progress or possibly to check it altogether. For the symptoms which the disease produces, and which bring the patient to the doctor, much can be done, and appropriate remedies will be at once suggested if the clue to the disease be discovered.

This communication has been more semeiological than therapeutic, i. e. has dealt more with symptoms than with treatment. My object has been to show the extreme variability of the symptoms of granular kidney. The treatment of the disease must be reserved for some other occasion. This much I think we shall all admit, that it is in the early stage of chronic disease that we may expect the best results from treatment, that correct diagnosis is the true basis of all rational therapeutics, and that it is quite impossible to foretell how far our treatment may be improved by more accurate and careful diagnosis.

ON THE TREATMENT OF UTERINE MYOMATA (FIBROIDS).

BY

J. BLAND SUTTON.

LECTURE IV.—VAGINAL OPERATIONS.

IT is a noteworthy fact that those who have made a careful and prolonged study of tumours, from the pathological as well as the clinical aspect, are unanimously of opinion that the most effectual method of treatment is *thorough removal of the tumour, whenever this is practicable, at the earliest possible moment.* In the case of uterine myomata the observance of this canon has only become practicable during the last five years. With the aid of anæsthetics, asepsis has revolutionised the surgery of the uterus, and some of the most brilliant and successful results of surgery have been obtained in connection with this organ.

Operations for uterine myomata may be arranged in two groups according to whether they are performed through the vagina or by means of an incision in the anterior abdominal wall (cœliotomy). Before describing the details of the operation, it will be necessary to define the terms used to designate particular methods.

I. VAGINAL METHODS.

1. *Vaginal myomectomy.*—This signifies the removal of a stalked myoma (polypus).

2. *Vaginal enucleation.*—This relates to the removal of a sessile submucous myoma.

3. *Vaginal hysterectomy.*—This term covers complete removal of the uterus, with or without one or both ovaries and Fallopian tubes.

II. ABDOMINAL METHODS.

1. *Abdominal myomectomy.*—This term signifies the removal of one or more pedunculated subserous myomata preserving the uterus, the ovaries, and the Fallopian tubes.

2. *Abdominal enucleation.*—By this operation a sessile subserous, submucous, or intramural myoma is shelled out of its capsule; the uterus and, as a rule, the ovaries with the Fallopian tubes are preserved.

3. *Supra-vaginal hysterectomy.*—By this method the uterus, with a portion of the cervix, is removed.

Sometimes one, and occasionally both ovaries and tubes are preserved. In these circumstances the operation may be termed "*conservative supra-vaginal hysterectomy.*"

4. *Pan-hysterectomy.*—This signifies complete removal of the uterus and its neck ; occasionally one or both ovaries and the Fallopian tubes are preserved.

5. *Oöphorectomy.*—In this procedure both ovaries and tubes are completely removed in order to arrest menstruation.

The remainder of this lecture will be devoted to the consideration of vaginal methods. The following instruments are necessary :

1. The crutch for securing the patient in the lithotomy position.
2. A duck-bill speculum for exposing the parts.
3. The uterine sound for determining the length and direction of the uterine cavity.
4. A vesical sound to determine the position of the bladder.
5. Volsellæ for manipulating the cervix and tumour.
6. Dilators for enlarging the cervical canal in order to afford access to the uterine cavity.
7. Sponge-holders.
8. Uterine probes.
9. Scissors, curved and straight.
10. Needles in handles.
11. Speculum forceps.
12. Hæmostatic forceps.
13. Retractors.

All these should be of metal, in order that they may be sterilised by boiling.

In addition a douche-can, artificial sponges, silks, gauze for tampons, lubricating substances and antiseptic solutions, and a soft catheter.

Vaginal Myomectomy and Enucleation.

The steps of this operation vary considerably as they depend upon the size, condition, and position of the tumour, but the preliminary preparation of the patient is the same in all cases, and consists of thorough evacuation of the bowels by purgatives aided by soap and water enemata ; careful anti-

septic douching of the vagina during two or three days preceding the operation. Mild solutions of perchloride of mercury (1 in 5000) or tepid water lightly tinted with permanganate of potash answer very well for this purpose, as they are colourless, odourless, and thoroughly reliable antiseptic reagents.

The patient is anæsthetised and secured by the crutch in the lithotomy position and placed in a good light. The operator then exposes the cervix by means of a duck-bill speculum and thoroughly douches the vagina. The first step is to determine whether he has to deal with a tumour of the uterus or the fundus of a partially inverted uterus, and should remember that a submucous myoma (polypus) sometimes leads to inversion (Fig. 1), and a myoma protruding at the os strikingly resembles an inverted fundus. The uncertainty is dispelled in this way. In a case of polypus, when the sound is introduced into the uterus, it will pass to the full length (2½ in. 6·2 cm.), more often to a greater distance. In a case of inversion the sound passes between the uterine wall and the inverted fundus, and is arrested at less than the normal length. So far, it is certain that when the sound passes 2½ or more inches there is no inversion, but it does not follow that if it passes less than 2½ inches that the fundus is inverted. In the case of a small cervix-myoma the sound may be arrested at the top of a dilated cervix, and yet there may be the whole uterine cavity above.

There is, however, another test which is very valuable and easily carried out when the patient has thin or lax abdominal walls ; this is the presence of a cup-like depression replacing the normal convexity of the uterine fundus. This depression can be detected by a finger in the rectum, and even better by dilating the urethra and introducing the forefinger into the bladder.

As soon as the operator has satisfied himself that he has to deal with a myoma he carefully determines its size, character, and situation, as his subsequent manœuvres vary with these conditions.

1. *A pedunculated myoma (polypus) protrudes from the os uteri.*—The operator determines whether it is stalked or sessile. Should it be stalked, he determines the position of the pedicle, and is often able to detach the tumour by twisting it. Should the stalk be too thick to allow this, it

may be cut through with scissors, or be transfixed with silk, ligatured, and then be bloodlessly detached. The forefinger is then introduced to determine the existence or otherwise of other tumours, the parts are then irrigated and dried with cotton-wool on a uterine probe or a sponge holder; it is usual, but not indispensable, to introduce a tampon of cotton-wool or gauze, impregnated with some mild antiseptic (liquid or powder) reagent, into the vagina, and the patient returned to bed. The tampon is removed in twelve hours, and the vagina douched twice daily. If there is much anæmia some mild preparation of iron may be prescribed, and at the end of two weeks the patient is, as a rule, convalescent.

dilated cervical canal.—It occasionally happens that the symptoms presented by a patient favour the presumption that there is a submucous myoma; the surgeon dilates the canal, and should a myoma be present he determines its size, condition, and situation. In many instances he is able to deal with it in the manner described in the preceding sections. Often, however, he will find himself face to face with a very large pedunculated myoma or a large sessile myoma with a broad base. The stalked tumour may be easily detached by twisting, but there may be great difficulty in extracting it; in the case of a sessile tumour there will be difficulty in enucleating as well as in delivering it. No definite rules can be laid down as to the size which

Fig. 1.—Partial inversion of a uterus due to a myoma (polypus).

2. *A sessile myoma protrudes at the os uteri.*—When the tumour does not exceed the dimensions of a bantam's egg, the operator carefully determines that he has to deal with a myoma and not an inverted fundus. After enlarging the cervical canal by means of dilators, he splits the mucous membrane and capsule, and by means of finger or raspatory shells the tumour out of its capsule as far as its base. The tumour is then seized with a volsella and cautiously twisted and pulled out of its bed.

Should the bleeding be free, the cavity of the uterus may be stuffed with sterilised or antiseptic gauze for thirty-six hours.

3. *Sessile and pedunculated myomata with an un-*

determines whether a tumour can be expeditiously and safely extracted by the vaginal route. When a woman has had children, then the stretched vagina and lax uterus will allow tumours as big as a child's head to be extracted, whereas in a sterile woman with a firm and unyielding cervix, difficulty may be found in withdrawing a tumour of the size of a bantam's egg.

When a myoma is too large to traverse the cervical canal without the exercise of undue force, I never hesitate to split the cervix bilaterally; then, after withdrawing the tumour, suture the cut cervix with silkworm gut. I have successfully enucleated unusually large tumours by turning the bladder off the cervix, and then dividing the anterior wall of

the cervical canal as high as the internal os ; this manœuvre greatly facilitates the enucleation, saves tearing and bruising of tissues, as well as shortens the time of the operation. After extracting the tumour, the edges of the cervical incision are brought together by sutures of silkworm gut. I have even removed through the vagina sessile sub-serous myomata from the cervix by detaching the bladder in this way. .

Until the introduction of antiseptic and aseptic methods into surgery the dangers of enucleating submucous myomata were many and great.

The chief dangers are—

1. Hæmorrhage.
2. Perforation of the wall of the uterus.
3. Sepsis.
4. Inversion of the uterus.

With care and caution all these are, as a rule, avoidable, and the operation should have no evil consequences.

It is well to bear in mind that when a sub-mucous myoma of the uterus becomes septic, salpingitis is a frequent complication ; hence manipulation of the uterus in vagina myomectomy may rupture a pus-containing tube with a fatal issue.

Vaginal Hysterectomy.

This method of dealing with myomata is not very often performed in England, because when it is possible to successfully remove the uterus by the vagina, the tumour could in the majority of cases be extracted and the uterus preserved. It is, however, easy to understand that there are con-ditions in which extirpation of the uterus may be necessary ; for example, in extracting a large sessile intra-mural myoma, profuse and not easily controll-able bleeding sometimes ensues ; or the uterine wall in relation to the tumour may be torn through in detaching the tumour, and in cases of septic submucous myomata with extensive implication of the endometrium complete removal of the uterus with the tumour would, as a rule, be safer than extraction of the septic organ by means of cœlio-tomy. In Germany and France very large examples of uterine myomata are removed by the vagina, and when the tumour is too large to be extracted entire it is cut by means of strong scissors and forceps and removed piecemeal, a method known as *morcellement*. At present this

method has not been much practised in England, but Pean, Richelot, Landau, and others have had very gratifying results.

The preliminary steps are the same as those described for vaginal myomectomy, and the in-struments are the same as those already enumerated, with the addition of some strong clip-forceps, which may be necessary for securing the vessels in the broad ligaments.

The steps of the operation are as follows :—The patient is anæsthetised and secured in the litho-tomy position by the crutch, and arranged so that the perinæum faces a good light. The hair is shaved from the pubes and labia (it is an advantage to have this carried out by the nurse some hours previously, but it is not always agreeable to the patient), and the external parts washed with warm soap and water and then douched with a solution of perchloride of mercury (1 in 1000) or some equally efficacious antiseptic.

The operator, seated at a convenient level, introduces the beak of the speculum into the vagina, and passes a sound into the bladder ; this the assistant retains there in order to keep the operator informed of the relation of the bladder to the cervix throughout the first stage of the operation.

Stage 1.—This consists in seizing the cervix with a stout volsella, and then by means of a scalpel the mucous membrane on its anterior aspect is transversely divided at a point suffi-ciently low to avoid injury to the bladder. The bladder is then cautiously separated from the cervix with the forefinger, assisted, if necessary, with the handle of the scalpel ; it is an advantage to divide the peritoneum forming the lower limit of the utero-vesical pouch, and gain access to the peritoneal cavity. Throughout this stage the operator constantly informs himself of the exact position of the bladder by manipulating the sound.

Stage 2.—The incision in the mucous mem-brane is now carried round each side of the uterus, and by means of scissors the recto-vaginal pouch is opened, and a sponge is introduced to protect as well as to restrain the bowels and omentum.

Stage 3.— The broad ligaments are dealt with in the following manner :—A curved needle in handle armed with strong silk is made to transfix the con-nective-tissue tract close by the side of the cervix in order to avoid the ureter. The object of this

ligature is to secure the uterine artery near the spot where it turns on to the side of the uterus. The ligature is firmly knotted. Very often the artery may be seen. It is then picked up with forceps and deliberately tied. When the artery has been secured on each side, and the tissue between the ligature and the uterus divided with scissors, the organ can now, as a rule, be drawn low down into the vagina, and the upper segments of the broad ligament transfixed with double silk ligatures. These embrace the Fallopian tubes with the ligament of the ovary, the ovarian artery and veins, and the round ligament of the uterus ; the tissues between the uterus and the ligatures are divided, and the uterus is removed. Should an ovary or a Fallopian tube be found diseased, then they should be removed by transfixing the pedicle with silk.

If the silk threads have been properly secured there is, as a rule, no bleeding ; should any free oozing be noticed, the bleeding point is sought, seized with hæmostatic forceps, and ligatured with thin silk.

The vagina is then irrigated with warm water, the sponge removed, and if the cut edge of the vaginal mucous membrane bleeds,—a frequent condition,—it is useful to secure it with a continuous suture of thin silk, or arrest the bleeding with forceps and leave them on for twelve hours.

The ligatures used to secure the broad ligaments are left long, those of each side are knotted together, and a strip of gauze is introduced into the vagina to serve as a drain.

The details given above are those which are easily carried out when the vagina is capacious, and the uterus but slightly enlarged and mobile. It is very different when the vagina is narrow and rigid, as in virgins, and especially when the uterus is large, and cannot be drawn down. In these circumstances very much depends on the experience and skill of the operator. Sometimes it is necessary to divide the perinæum, and even to make incision in the lateral walls of the vagina. In some cases it is useful to secure the uterine arteries, and then split the uterus sagitally with scissors and remove it in halves, or adopt the method of *morcellement*, and excise it piece by piece.

Many operators do not employ ligatures, but prefer to secure the broad ligament on each side of the uterus with specially constructed clamps.

The uterus is then cut away, and the clamps remain *in situ* for about forty-eight hours ; they are then carefully removed.

Each method has its advocates, and there are advantages and disadvantages associated with both. The employment of clamps greatly shortens the time occupied in the operation.

Operative dangers.—The chief of these are the following :

1. *Injury to bladder.*—If this viscus be cut the opening needs to be carefully secured with a continuous suture of thin silk.

2. *Injury to ureters.*—These ducts are sometimes damaged in reflecting the bladder from the cervix, but they are more liable to be included in the ligatures applied to the bases of the broad ligaments, and this is one of the reasons why it is preferable to deliberately expose and ligature the uterine arteries. The accident has happened to many operators, and the sequel is invariably serious for the patient, and fraught with great anxiety to those in charge of her. The recognition of the accident and the manner of dealing with it will be detailed in Lecture VI.

3. *Injury to bowel.*—Occasionally the rectum has been cut in making the opening into the recto-vaginal fossa, and the small bowel has been nicked with the scissors in cutting through the broad ligaments. Should the small gut be adherent to the uterus, it is apt to be torn. Such an injury will lead to the formation of a fæcal fistula, which is usually temporary, but a source of inconvenience and great distress as long as it persists.

4. *Bleeding.*—However carefully the bleeding may be controlled, whether by ligature or clamp, there is always a small quantity of reddish serum finds its way down the gauze drain. Any serious loss of blood is due to the slipping of an ill-applied ligature or clamp, or a vessel which remained unsecured, and then bled freely as the patient recovered from shock and anæsthesia. Free bleeding necessitates re-examination of the parts under an anæsthetic, and whilst preparations are being made to carry this out, the loss of blood may be in a measure controlled by temporary digital pressure applied to the abdominal aorta. As soon as the source of the bleeding has been detected and secured, the patient should be transfused in cases where the hæmorrhage has been severe. A

simple apparatus for this purpose is represented in Fig. 2. It consists simply of a yard of india-rubber tubing to which a funnel is attached. The opposite end of the tube is fitted with a glass (or metal) nozzle with the point fine enough to enter the median basilic (or the median cephalic) vein. The nozzle is introduced into the vein and secured by a silk ligature, and two to three pints of saline solution, consisting of a teaspoonful of clean table salt (chloride of sodium) to a pint of water at a temperature of 100° is allowed to slowly run into the vein. The effects are often magical.

This simple apparatus is always ready in the

is very carefully isolated from its fellows and the handles unlocked ; after waiting a few moments, if there be no trickling of blood, the blades are detached by a gentle twisting movement. Should free bleeding occur in attempting to detach a clamp it is wise to re-lock it and leave it *in situ* for a further period of twenty-four hours. Oozing on the attempted removal of one clamp should not deter the surgeon in attempting to remove its companions. The temperature after vaginal hysterectomy usually rises towards the close of the second day; this is due to separation of ligatured or clamped, and therefore necrosed, tissue. It may
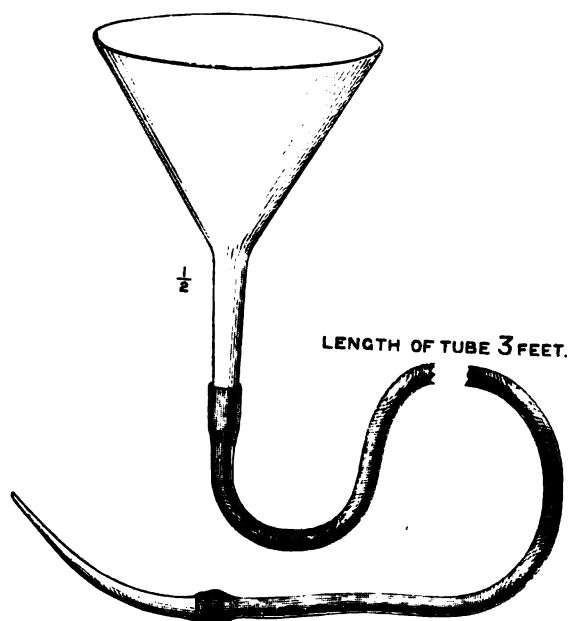
Fig. 2.—A simple apparatus for transfusing with salt solution.

theatre of the Chelsea Hospital for Women. It is a modification of that designed by Dr. Horrocks. Mr. C. Beauchamp Hall has demonstrated that the solution flows better from a funnel than from the cylinder originally fitted to the apparatus.

The after treatment.—This is carried out on the same lines as those adopted after abdominal hysterectomy, and is fully detailed in the next lecture. The vagina of course needs to be considered ; for instance, the gauze may be changed in thirty-six or forty-eight hours. If clamps be used, these need to be taken away with the following precautions :—The patient's thighs are slightly raised and the knees gently separated, then a clamp

rise as high as 103° F., and the discharges become offensive. At the end of six days gentle irrigation with sterilised water is useful, and the temperature declines to normal. By the ninth day the ligatures begin to become detached, and, as a rule, they are all away by the twentieth day. Occasionally one or two remain in for several weeks. Generally the patient is allowed to leave her bed at the end of the third week.

Sequelæ. — Vaginal hysterectomy, like other surgical proceedings, is liable to be followed by evil consequences. Thus the operation may be rapidly fatal from shock and hæmorrhage. Death may follow in a few days from peritonitis (sepsis),

and occasionally from injury to the ureters. With care, however, and with strict asepsis the operation has a very low rate of mortality (5 per cent.). The sequelæ are purulent discharge due to retained ligatures, vesical complications, especially cystitis and occasional thrombosis of the pelvic veins with œdema of the lower limb and liability to embolism. In a few instances fatal intestinal obstruction has supervened on this operation, but patients seem less liable to this grave complication after vaginal than after abdominal hysterectomy or ovariotomy.

NOTES, ETC.

Pregnancy complicated with Cancer.—Among the interventions which should be condemned being performed on pregnant women afflicted with carcinoma of the uterus, are the following : Firstly, *artificial abortion*, because the interruption of pregnancy is only useful at the very beginning, when the symptoms of congestion have not as yet given the rapidly progressing character of carcinoma, and Pozzi rightly says that the diagnosis of pregnancy is impossible before the fourth month in women who have carcinoma uteri.

Secondly, *amputation of the cervix*. If in some instances the mother has been able to obtain a momentary amelioration from this operation, in the greater number of cases the results have been unfavourable. Labour is in no way rendered more easy, and on the contrary is more difficult, while the fœtus is in great danger.

Thirdly, *total hysterectomy*, whether it is Freund's operation, which consists of the Cæsarean operation during pregnancy, followed immediately by a total ablation of the uterus, or Mackenrodt's operation, which is a total removal of the uterus containing the product of conception after removal of the neoplasm on the cervix with the curette, and also vaginal hysterectomy should be discarded in practice. All these methods are condemned by Bosche in his recent monograph and he believes that it is proper to allow pregnancy to go to term. As proper operations he considers curettement of the cervix indicated if there be hæmorrhage, and he advises premature labour when the child is alive and likely to live.

During labour the physician should remember that many of these patients have a natural delivery, but if dilatation progresses badly, Champetier's bag or the very useful and ingenious dilator of Tarnier may be employed to hasten events.

Guéniot makes a number of small incisions in the cervix, but for all this they do not prevent rupture of the uterus from occurring. Bar says that incision made in the cervix is not an operation without consequence and importance. These incisions are useful when dilatation is incomplete, but sufficiently far enough advanced for labour to end in a natural delivery at the expense of this trivial operation, which is also especially indicated under these circumstances if the walls of the organ are nor very thick.

When dilatation is sufficient for the application of the forceps they may be applied, but if the fœtus is dead, basiotripsy should be resorted to at once. The Cæsarean operation is the proper one when the circumference of the cervix is involved by the neoplasm, thus preventing dilatation. It should be performed at the end of gestation before labour has set in. The longer one waits, the more serious becomes the prognosis, and is in direct relation to the length of time since the beginning of labour.

We should always give our preference to conservative methods when hæmorrhage or infection does not compel us to remove the uterus completely. It does not appear rational to complete the Cæsarean operation by a supra-vaginal amputation of the uterus, because the tissues which are part of the pedicle in question are in part degenerated, and will in all probability suffer from gangrene. Porro's amputation should only be performed in case of rupture of the uterus resulting in a wound with irregular borders, which are impossible to bring together with sutures.—*Annals of Gynecology and Pediatry*, February, 1898.

Pulmonary Embolism following Mercurial Injections.—According to Epstein ('Annales de Dermatologie et de Syphiligraphie,' December, 1897 ; 'Lyon Médical,' January 16th, 1898), the treatment of syphilis by injections of insoluble mercurial preparations presents, in a large number of cases, an incontestible superiority, and the practice should not be renounced unless the complications on the part of the lungs produced by embolism are frequent and grave.

From 1892 to 1896, under the direction of Dr.

Jadassohn, in Breslau, 227 men and 681 women were treated with injections of insoluble mercurial preparations. In all 8292 injections were made, ordinarily with thymol, mercury acetate, or mercury salicylate in liquid paraffin. Among these patients embolisms were ascertained as follows: In 1752 injections in men; in 1090 injections in women; and in 1185 injections in persons of both sexes.

No deaths occurred in the cases of embolism; furthermore, all the patients were cured in a short time. The author does not, then, concur in the opinion lately expressed several times in favour of rejecting injections of insoluble mercurial salts solely because they may accidentally give rise to pulmonary embolism. He is in this respect, in complete accord with the majority, not only of German physicians, but of other physicians.

According to Möller, the following rules should be carried out in order to avoid an injection into a vein and consequent pulmonary embolism: At first the mass to be injected should be deposited in the gluteal region and as deep as possible, so that the injection is made above the muscles or in the superficial part of the gluteus. The upper gluteal region, above the horizontal line which touches the upper part of the great trochanter, presents the least danger from embolism. Möller seizes a thick fold of the skin and of the subcutaneous tissue parallel with the median line and introduces the cannula (which should be at least $3\frac{1}{2}$ cm. long) for its entire length, following an oblique line in the direction of the fold of the skin and deep into the skin and the subcutaneous tissue in order that the injection may stop short of the muscle, or at least touch only the superficial part of it.—*New York Medical Journal*, February 12th, 1898.

Practical Muscle-Testing and the Treatment of Muscular Atrophies. By W. S. Hedley, M.D., Medical Officer in Charge of Electro-Therapeutic Department of the London Hospital.—London, H. K. Lewis, 1897. (8vo, pp. 128, 3s. 6d.)

Rightly or wrongly the subject of electrotherapeutics has come to be associated in the minds of most medical men with diffuse ambiguity, with loose generalisation, and, in many cases, with vague statements ascribing impossible virtues to processes of treatment, chiefly remarkable for bewildering futility of detail. Notwithstanding this prejudice, Dr. Hedley's admirable volume

undoubtedly secures for a scientific and fascinating branch of medical knowledge the high position due to its importance. The author puts the case in such a clear and convincing manner that we cannot do better than recapitulate his argument. It is a question whether, in the already overcrowded medical curriculum, room can be found for electro-therapeutics. But at least it may be conceded that a useful and even a necessary part of every medical education is the acquirement of a certain familiarity with the technique of electro-diagnosis. To attempt any adequate clinical study of diseases of the nervous or muscular systems without this aid is to grope about in the uncertain twilight for something that might be looked for in the light of day. Uncontrolled by the patient's will, uninfluenced by his story, the electrical reactions of a muscle tell their own tale, and often reveal the one objective feature, the one distinctive physical sign that alone is necessary to differentiate the morbid change. It is scarcely an exaggeration to say that what the stethoscope is to pulmonary and cardiac conditions, what urine analysis is to renal disease, such is electrical exploration to normal and abnormal conditions of the neuro-muscular system. By this means not only it is often possible to distinguish with certainty disease of the lower segment of the motor path, to affirm the presence of a neuritis, or of an anterior poliomyelitis, to exclude the paralysis of cerebral disease, of diseases limited to the white matter of the cord, of hysterical paralysis, of pure myopathics but there are cases frequently occurring where the distribution among the muscles of the abnormal electrical reactions may lead to a localisation yet more exact, and disclose with something like certainty the actual seat of the morbid process. It must not be imagined that an electrical diagnosis is quite an easy and simple matter. It requires a considerable experience and involves a procedure that ought to be rigorously exact, approaching, indeed, as far as possible, the conditions of a physiological experiment. Yet there is nothing mysterious in the method, nor complex in the instrumentation. The merest outline only of electrical knowledge is necessary. An induction coil and a battery of 30 or 40 cells is the only apparatus required. It is impossible to do more than indicate, as far as possible, the scope of this masterly work, and to draw the attention of the profession to its publication. The author modestly speaks of trying to make "a useful compilation," but he can rest assured that, call his work what he may, the fact remains that the medical public cannot fail to appreciate that practitioners have now available, ready for practical application, methods of diagnosis and lines of treatment founded on a scientific basis, and recognised as correct, legitimate, and reasonable.

THE CLINICAL JOURNAL.

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NOTICE.

DEMONSTRATION OF CASES IN THE WARDS OF CHARING CROSS HOSPITAL,

Thursday, January 27th, 1898,

BY

FREDERICK C. WALLIS, B.A., M.B., B.C., F.R.C.S.Eng.,

Assistant Surgeon and Lecturer on Minor Surgery at the Hospital.

LADIES AND GENTLEMEN,—This little girl had last summer a very bad psoas abscess in connection with angular curvature. She was brought to me for the curvature, which you will see in the middle and lower dorsal vertebræ. In addition to that she had the usual signs of abscess in connection with the vertebræ, namely, a tense elastic swelling situated in one or both iliac fossæ. When these cases are treated according to the recent methods of surgery they do extremely well, as this child has. The procedure I have adopted in these cases, after various attempts, is to open up the abscess at the most prominent place, which is generally where you see I have done it, namely, about on a line with or a little below the anterior superior spine,—the sort of incision you might make for tying the external iliac artery. Then you dissect down, and when you come upon the sac of the abscess you may find the peritoneum adherent to it. With a little manipulation the danger of wounding the peritoneum is obviated. Having opened the abscess, it is washed out by means of an absolutely sterile irrigator, with a 1 in 2000 perchloride solution. I should mention, first of all, that a long pair of forceps is inserted in the wound, and that at the highest point of the abscess cavity an incision is made down on to the forceps; by that means you avoid injury to any nerves or vessels. Then the abscess cavity is scraped out, and the wound is thoroughly washed with the solution I have mentioned, and the cavity is also well rubbed with iodoform paste. This paste consists of a mixture of simple iodoform powder, with

1 in 20 carbolic or 1 in 500 perchloride, making a sort of paste of it. It answers very well for all skin wounds, and is nearly always used here in preference to the ordinary dry powder. Then the whole cavity is stopped with iodoform gauze (not too tightly), the gauze being in one strip and the end brought out at the posterior incision. The anterior incision is sewn up and covered with collodion, and in the posterior incision some stitches are put, and the upper and lower are tied, but the two middle ones are left long, just tied to prevent their slipping out. The wound is dressed in the ordinary way, with plenty of packing, till thirty-six or forty-eight hours afterwards. The wound is then redressed, the whole of the gauze removed, and any fluid which was in the cavity comes out with it. Then the two stitches which have been left long are tied close, and the wound is sealed. In the case of this child, and in others I have operated upon, no further dressing has been necessary. The patient is left alone until the stitches are ready to come out, when they are removed. The patient is then ready for some form of jacket, such as this little one has on. We have not allowed this child to walk since the operation, because I felt that, as it is a growing child, the probabilities were that the disease had not quieted down so much as we hope it has now. This would be a splendid case for straightening the spine by forcible extension if I felt justified in doing it. I have listened to the advocates of this plan, have read all I could on the subject, and have thought about it, but I do not think that we are justified in carrying out this procedure. I should feel more easy about if I could be shown some cases which have been treated in this way some time ago, and which had not gone back somewhat to the original condition of affairs. The danger is that caries of the spine means loss of substance, and in this child it means loss of two or three bodies of the vertebræ. The hump comes there by the approximation of these carious surfaces. I have not the least doubt that we could straighten the spine with very little extension, but in that case instead of approximation of the surfaces there would be an interval. What is going to fill up that interval? I do not see where the bone-producing material is coming from, and fibrous tissue would not perform the desired purpose. I think the case shows the wonderful

advantage of the aseptic treatment of these cases. There is another girl in the ward on whom I operated two years ago, and it was my procedure in that case and watching the effect of it that led me to do as I have done in our present patient. In the former case I did not heal up the wound at once, but let it drain for ten days. Unfortunately the patient got scarlet fever, and was taken to the scarlet fever hospital. When she returned from there she was in a very septic condition, and has remained so. The fact is, general sepsis takes a long time to eliminate. She has been very ill, and has had a number of suppurating wounds.

We have here in operation the Tallerman-Sheffield hot air apparatus, which you have all heard about and probably have seen. It has proved to be very good indeed for stiff joints and conditions of that sort. You will notice a thermometer inside. A temperature of 260° F. can be borne by most patients. Stiff joints put into this become, after about half an hour, very supple. This patient's wrist was very stiff when she put it in, and you will now notice that it is quite the reverse.

This young girl, who had been in some home, came to me at the out-patient room with a bad knee. You will notice at once the difference between the two knees; in one you will see the pouches or cavities at the sides of the patella, while in the other they are obliterated, the effusion into the joint replacing the concavity by a convexity. Moreover there is a marked difference in the temperature of the two knees, which is evident to the touch. Thirdly, the superficial veins are dilated in this knee compared with those of its fellow. There is no history of any injury, but there is a history of tuberculosis in the family. There is very little doubt about the condition being tubercular. If further proof of its nature were needed, we have it in the fact that there is fluid in the belly, doubtless due to tubercular peritonitis. This fluid shifts about in the way usually found. There is not much matting of the intestines. These cases of tubercular peritonitis in the early stage do remarkably well under medical treatment; mercurial inunction has a marked effect. I have had three or four patients treated in this way, and the effect has been quite good. Of course, if this patient gets worse we shall have to seriously consider the question of laparotomy. This operation is most beneficial. The mere fact

of opening the abdomen seems to make some beneficial alteration. Sometimes, in bad cases, it is advisable to irrigate the abdomen with an ordinary warm saline solution. I have now two or three children running about in good health on whom I performed laparotomy, and I know of others upon whom I assisted to operate, and in one of whom the condition was mistaken for sarcoma of the kidney. In another case of mine the intestines were matted together, and the condition was suspected to be intussusception, but it was found to be simply tubercular peritonitis, and nothing else was done beyond opening the belly. The boy improved, and if I were to show him to you to-day you would say there was nothing the matter with him. This patient presents what is rarely seen, namely, tubercular peritonitis and tubercular joint lesion.

This young woman fractured her patella twelve months ago; it was a simple transverse fracture, with an inch separation and great effusion of blood. When operating I made the incision at the side, where you see the scar, so that it should not be directly over the wire. The result is remarkably good. I do not think you can feel the wire. She has normal use of her knee-joint.

I should like to mention two other cases in this connection. Two girls came in the same day; both had fractured their patellæ. One was a simple transverse fracture from the violence of indirect muscular action; the other was a case which had been in another hospital for six weeks for fracture of the patella. The latter patient had only been out of the hospital two days when her plaster of Paris slipped and she fell down. When I saw her after this accident the patella was in a bad state. The two halves of it had widely separated, and the upper portion was torn in two, and one part hung down free; the lower portion was divided into two longitudinally. I removed the loose portion and wired the remaining portions. She made a very excellent recovery, and all healed by primary intention. The interesting point is that the girl upon whom I operated six weeks ago for simple fracture has almost as good movement in the limb as had this woman after twelve months. The other girl, whose knee had been six weeks in an apparatus, had a very much stiffer knee. She is being massaged with good effect.

In fractured patella I think the incision you see there is very much better than the straight one. I believe the real reason for non-union of these fractures is that a piece of the aponeurosis becomes stretched, and when the fragments of the patella are brought together the aponeurosis becomes sandwiched between the fragments of bone. Under these circumstances osseous union is impossible. It is a good practice to bore a small hole in either fragment, and put in a piece of fairly thin wire. At the end of the fourth day after the operation I make it a practice to do lateral movement of the patella. By that means the possibility of adhesions is very much reduced. At the end of twelve to fourteen days I begin moving the limb a little up and down, which allows the joint surface to move without the patient putting forth any muscular power. At the end of three weeks I allow patients to walk about with a splint on.

This patient is a very interesting case of renal calculus. She came in July last with a very large swelling in the left kidney region. There seemed a great deal of reason for supposing that the trouble was renal, and the probabilities were that it was a calculus. Under that idea I made an exploratory incision. I made a long T incision, and found the kidney was a very large one. After considerable difficulty we brought out a large calculus, which is now in the museum. At the bottom of the wound was a small calculus, but, as she was getting bad, and had had enough of the operation, we left that alone; we left the drain in. The wound healed up very well indeed, with the exception of where the drain was. We then let her get up, and her temperature went up to 105°; it eventually went down to normal, and since she has got up the second time she has remained all right. When her temperature went up there was evidently some further trouble, and the wound was dilated under an anæsthetic, and exploration made for anything causing irritation. The calculus which had been left was completely shut off. We found nothing wrong, and the question was whether there was a kink in the ureter. Now the kidney is so firmly fixed that there has been no trouble since. She still has a certain amount of pus in her urine; the urine has always been acid. She is now going away to the convalescent home. You will notice the peculiar colloid condition of the scar.

This woman has a tumour in her breast, and has been aware of its presence four months. It is rather painful, and she has observed that it grows. She has had an abscess in this breast. It is too tender for you all to feel it, but I ask you to take my word. The tumour is close under the skin, and when I pucker up the skin you see the tumour is more or less adherent to it. There is no retraction of the nipple. When I place my hand flat on it, it is felt to be hard, but not of a stony hardness, which is a feature of scirrhus. She has enlarged glands in her axilla. Two days ago I thought it was scirrhus, but now I think it shows the signs of interstitial mastitis, and I am further inclined to that opinion because when placing the hand flat on the part there is not that feeling of the tumour coming up to meet the hand which is observed in scirrhus. The fact of there being enlarged glands in the axilla does not show it is not interstitial chronic mastitis. The nodules are somewhat separate, and are moderately soft as compared with the stony hardness of scirrhus. There was milk in the breast, but it has gone now, and that may account for the different impression it gave two days ago compared with the present time.

This patient, a young man, had a very bad ulcer on his leg—a traumatic ulcer over the tibia. He was in bad health, and struck his knee at work. Although the leg was fomented with boracic acid, the ulcer got bigger and adhered to the periosteum, so that after a fortnight or three weeks' treatment it was two and a half inches across at any point. He rested the leg for a long time, but directly he began to get about again the ulcer got worse. It is no good putting these patients in bed, and putting on a Thiersch's graft, because the ulcer breaks down again when they get up. When the ulcer was healthy I refreshed the edges all round; then I made two long lateral incisions, and undercut between the two sutures, making the flaps free; then the edges were brought together and stitched. I particularly aimed at having no tension. Then I put a Thiersch graft on the raw surface of the lateral gaps. That is twelve months ago. I showed him at the Clinical Society. You see there is a sound scar, and the leg seems to be a good sound one. I have followed the same method of procedure since, and with the same result.

Last August this young man ran a knife into the palm of his hand. The wound healed up

all right, but you see that he has wasting of the interossei. The deep branch of the ulnar nerve, which supplies all the interossei, has been damaged, and paralysis of the interossei of that hand is the result. The superficial branch seems to be intact. He is having galvanic baths. It is interesting as showing what damage a little cut can do if it is in an unfortunate place.

This man is an old soldier. He was in the 11th Hussars in 1875, and whilst getting on his horse in India he·"felt something go" in his thigh. He did not say anything about it, and went on riding and doing his duty for six weeks. Then he went to the hospital, and the surgeon told him he ought to be in prison for not coming to him sooner. He was in bed six weeks, was then invalided home, and has since been invalided out of the service. There has been a rupture of the adductor longus, and a curious point about it is that it is as hard as a brick, giving one the idea a muscle is ossifying, or that he has some calcareous change, but against the latter is the fact that it is movable. If it were in connection with the periosteum or bone in which the muscle is inserted there would be a solid mass. If it is a calcareous deposit in the muscle it is a curious condition. To my mind it seems like a dense mass of fibrous tissue. We have all seen muscles ruptured, but I have never seen one after such a long interval as twenty-two years. The fact that he was able to go on for such a long time suggests that it was not a complete but a partial rupture of the muscle. You will find there is no absolute loss of continuity.

This man has a curious fracture. If you feel both wrists you will find, when you come down to the lower end of the anterior surface of the radius, a very marked alteration, a large hard lump on the anterior aspect of the lower end the radius. The fracture is a partial one; the bone has been shoved forward by falling. The condition is really an abortive Colles' fracture, such as has been described by Senn.

Tuberculosis of the Tubes.—Jacobs recently operated on a young woman to remove an enormous abscess of the left tube, which proved to be tuberculous, and later the right tube had to be removed for the same cause. There were no other manifestations of tuberculosis. — *Presse Méd.*, January 1st.

ON THE TREATMENT OF UTERINE MYOMATA (FIBROIDS).

BY

J. BLAND SUTTON.

LECTURE V.—SUPRA-VAGINAL HYSTERECTOMY AND MYOMECTOMY.

THESE operations are performed for uterine myomata which on account of their size cannot be safely and expeditiously dealt with by the vaginal method.

Abdominal hysterectomy is always a grave proceeding. It is, however, indicated in cases where the tumour is impacted in the pelvis and interferes with the bladder, or leads to intestinal obstruction by pressing on the rectum or colon. Myomata which become cystic, inflamed (septic), or enlarge rapidly after the menopause, demand removal. Large submucous myomata which cause serious and repeated bleeding, and produce profound anæmia, causing the patient to lead the life of an invalid, justify operation.

Preliminary preparations.—It is a great advantage to keep the patient absolutely confined to bed two or three days preceding the operation. The rectum should be emptied by a soap-and-water enema, and the patient should abstain from food at least six hours before taking the anæsthetic; this diminishes the tendency to vomit.

Over-night the nurse shaves the pubes completely, thoroughly washes the abdomen with warm soap and water, and at least six hours before the operation she swathes the abdomen in a compress soaked with an antiseptic solution (such as carbolic acid 1 in 60 or perchloride of mercury 1 in 2000). Immediately before the patient is placed on the operating table the bladder is emptied naturally or by means of a catheter.

The Trendelenburg position, though not absolutely necessary, nevertheless greatly facilitates the operation.

Instruments.—The following are as a rule sufficient :—Scalpels, 2 ; dissecting forceps, 2 ; hæmostatic forceps, 12 ; retractors, 2 ; needles, straight 6 and curved 6 ; reels or tubes of plaited silk of various thicknesses ; a tube of fine silkworm gut ; sponges, 6 (2 flat and 4 round) ; sponge-holding forceps ; pedicle needles, 2 ; large pedicle forceps, 2 ; bladder-sound ; and a catheter.

It is necessary that all instruments shall be of metal throughout, in order that they may be boiled in the steriliser.

Silk and silkworm gut should be boiled twenty minutes in a solution of carbolic acid (1 in 40), and be preserved for use in glass tubes or jars containing carbolic acid solution (1 in 20).

Many surgeons have abandoned sponges, but nothing is equal to them in abdominal operations ; the only drawback to their employment is the fact that they require more than usual care in preparation in order to keep them aseptic. A sponge that has been in contact with septic matter should be immediately burned. During the operation the sponges should be rinsed in water at 100° F.

The steps of the operation.—As soon as the patient is completely unconscious a sound is introduced into the bladder, and the surgeon makes himself acquainted with the relation of the bladder and tumour. The sound is left in position, and acts as a pilot throughout the operation. The patient is then placed in the Trendelenburg position.

The incision.—The abdomen is opened by a free cut in the linea alba between the navel and the symphysis pubis. With a large tumour the incision will often require extension above the umbilicus ; it is necessary to cut cautiously in the neighbourhood of the pubes to avoid wounding a displaced bladder.

On gaining the peritoneal cavity the intestines should be at once protected by means of a warm flat sponge. The tumour is then examined, and the relation it bears to the uterus determined ; also the presence or absence of complications, such as the co-existence of ovarian tumours, visceral adhesions, or distended tubes. The operator then proceeds to ligature the blood-vessels, and as this is one of the most important steps in the operation it requires to be considered in detail. The arteries and veins of the uterus follow four distinct routes, and each route is easily accessible to, and capable of being safely controlled by a ligature.

When possible the tumour is drawn out of the pelvis, and each mesometrium is transfixed with a pedicle needle armed with a thread of plaited silk so as to secure the ovarian vessels on the inner or outer side of the ovary according as he decides to

remove or leave this organ. In some cases, apart from the physiological advantage, it is safer and more convenient to secure the ovarian artery in the mesosalpinx on the uterine side of the ovary. The silk is firmly secured, and the tissues between it and the uterus are divided, and any bleeding vessel is secured with hæmostatic forceps.

In many cases a myoma intrudes between the

becomes freer, and is easily manipulated. At this stage the uterine vessels may be detected in the vascular tract at the side of the uterus. When this is the case two courses may be followed; thus the surgeon may transfix the peritoneum and uterine tissues adjacent to the vessels, and secure them with a silk ligature at a spot near the middle of the supra-vaginal cervix, or he may seize
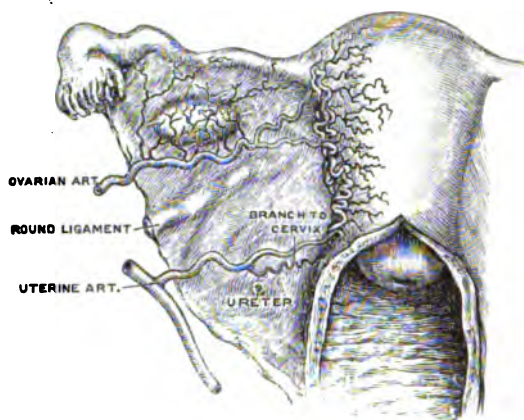
Fig. 1.—A diagram to show the relation of the ovarian and uterine arteries to the uterus.
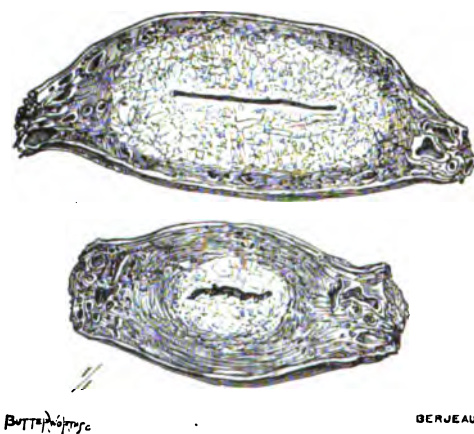
Fig. 2.—The uterus in transverse section to show the vascular tracts. In the upper figure the section is made through the middle of the body of the uterus; in the lower it is carried through the upper part of its neck.

Fallopian tube and the round ligament, and so separates them that they cannot be safely included in the same ligature. In these circumstances it is prudent to ligature the round ligament separately; it is sometimes necessary to adopt this course on account of the large size of the ligament, for it often shares in the hypertrophy of the uterine tissues.

When the mesometria are divided the uterus

them with hæmostatic forceps and ligature them at a later stage. When the shape of the uterus is distorted, and especially when the tumours are multiple and large, the vessels are often embedded in deep grooves and not easily accessible until the supra-vaginal cervix is freely exposed. It is also well to know that with very large tumours, the uterine arteries may be larger than the radials at the wrist.

It is impossible to prescribe precise rules for dealing with the uterine arteries in every case ; in this, as in most details of surgery, a little experience and common sense serve as very efficient guides, but there is one rule I always adhere to in this operation,—I take extreme care that every ligature applied to a vessel also traverses the peritoneum.

The peritoneal flaps.—At this stage the sides of the uterus have been exposed by division of the mesometria. It is now necessary to determine the relation of the bladder to the uterus. The surgeon then divides the peritoneum on the anterior and posterior surface of the uterus in such a way as to make them continuous with the opening in each mesometrium. These flaps are then carefully turned down; it is a great advantage to have plenty of flap, and the way the muscular tissue in the subserous tissue wrinkles them up is often very astonishing.

Amputation of the uterus.—The uterine arteries being secured, either with forceps or by ligatures, the uterus with its tumours is cut away. If the vessels have been properly secured, the cut surface of the cervical stump is usually white and dry; but small vessels in the peritoneal flaps may bleed and require ligatures.

In the case of a cervix-myoma the operation is somewhat modified thus :

The ovarian and uterine arteries are ligatured as described in the preceding section, and the expanded cervix with the tumour is drawn as far out of the pelvis as possible. The cervix is then incised and the capsule of the tumour freely opened to allow the myoma to be shelled out, but leaving the vaginal portion of the cervix like a shallow cup with a central perforation (the external os). The edges of the peritoneum and the cut margins of the cervix may be brought into apposition with the same sutures.

The advantages of leaving the lower half of the cervix in this way is very great, for all attempts to remove this segment of the uterus greatly endangers the ureters. Indeed the only safe way of avoiding the ureters is to keep inside the capsule of the tumour, and so well has this plan answered that in all my myoma operations I have never seen the ureters.

It is unwise to divide the cervix lower than is necessary to clear the tumour, because it not only

brings the operator into the territory of the vaginal branches of the uterine arteries, but it leads him into the immediate neighbourhood of the ureters.

Adjustment of the peritoneal flaps.—The pelvis is cleared of blood, and the parts carefully scrutinised to ascertain that all vessels are properly under control. It sometimes happens that it is convenient to leave the forceps on the uterine vessels and secure them at this stage ; this is accomplished by transfixing the peritoneal flaps in such a way that the silk encircles the cut vessels. On tightening the knot the vessels are secured, and the flaps approximated at the same time. Two or three interrupted sutures are then employed to fix the cut edges of the peritoneum over the stump, then the flaps are carefully brought together by a thin continuous silk suture from the ovarian pedicle of one side to that on the other. It is well to point out that when one or both ovaries are left (conservative hysterectomy) the flaps are much shorter than when they are removed. In suturing the flaps care must be exercised in order to avoid pricking the bladder. The pelvis is sponged dry, and the omentum is drawn over the intestines and spread behind the stump in the pelvis. Arrangements are then made to suture the wound ; the sponges and instruments should now be counted.

Suture of the wound.—This is of great importance. The method which gives me best results consists in uniting the peritoneal edges with a continuous suture of fine silk. The cut edges of the sheath of the rectus are drawn together with interrupted sutures of silkworm gut, and the skin is carefully approximated by a continuous suture of silk.

When the cervical stump is unusually thick and vascular it is sometimes advisable to introduce a narrow piece of india-rubber tubing into the rectovaginal pouch, and let it project at the lower angle of the wound.

Dressing.—A pad of sterilised or antiseptic gauze covered with a pad of absorbent cotton wool or gamgee tissue, and retained by a flannel binder. This dressing remains undisturbed for seven days unless drainage has been necessary ; in this event it will require changing every twelve hours as long as the tube is used. This is rarely needed more than fifty-eight hours.

Abdominal myomectomy.—It may happen when the surgeon opens the abdomen that he finds the myoma growing from the fundus of the uterus by a narrow stalk. In such a case he transfixes the pedicle, ligatures it tightly, and cuts away the myoma exactly as he treats an ovarian tumour. In some cases, especially when the pedicle is thick and near one or other uterine cornu, there is some difficulty in completely controlling the oozing from the pedicle. In such circumstances the removal of the adjacent ovary and tube close up to the cornu will often immediately arrest the bleeding.

The after results of myomectomy are admirable, as the surgeon leaves not merely the ovaries and tubes, but the uterus. When age and environment are favorable the patient may conceive. In some pregnancy has occurred, and terminated in happy delivery. An event of this kind was detailed in Lecture III.

The after treatment.—The patient is returned to bed with gentleness. A pillow is placed under her knees, and hot-water bottles to the feet, and it should be remembered that the patient is unconscious, and if the bottles are too hot the feet and legs will be blistered. The metal stopper of the bottle is particularly apt to do this if it comes in contact with the skin.

In two or three hours, as consciousness returns, the patient complains of pain and thirst. When the pain is very severe, a suppository containing a quarter of a grain of morphia may be given, or the same quantity of the drug may be injected in the skin. In the majority of cases no morphia is required, and the routine use of the drug is injudicious.

Vomiting.—This troublesome sequel is best treated by keeping the stomach empty twenty-four hours. In order to relieve thirst the patient may frequently wash the mouth with cold or hot water, but should avoid swallowing it. Vomiting during the first twenty-four or thirty-six hours, though distressing to the patient, is of no serious moment; but when it persists for two or three days, and is accompanied by a quick pulse and a distended belly, is a distinctly unfavorable sign.

Diet.—At the end of twenty-four hours small quantities of barley water, or of milk and soda water are to be given, and if retained may be given in greater quantity and at shorter intervals. On the third day boiled fish and custard pudding, chicken jelly, or pounded chicken are allowed, and the patient soon gets well enough to take convalescent diet.

No precise rules can be formulated in dieting patients, as many cannot take milk, and some refuse beef tea.

When vomiting gives trouble it is wise to abstain from administering food by the mouth and sustain the patient by nutrient enemata given at regular intervals. Three ounces of strong beef tea, containing if necessary half an ounce of brandy, is easily retained by the rectum, and may be repeated every four hours. When it is necessary to continue rectal feeding three or four days, the rectum needs washing out with warm water once daily.

Distension of the bowel.—Accumulation of gas in the large bowel often causes much distress, especially when morphia is given. The use of the rectal tube every three hours is an excellent means of preventing this distension; its use should be discontinued as soon as the patient can expel the flatus herself; this requires about thirty-six hours.

The bladder.—It is always wise to encourage patients to pass water unaided. In many it is necessary to use the catheter every eight hours. Before using a catheter the nurse should wipe away any mucus that may have collected around the urethral orifice; cystitis causes much misery. After hysterectomy, even when the patient passes urine unaided, it is judicious to pass a catheter once in thirty-six hours to be sure that she completely empties her bladder. The utmost watchfulness is necessary to ensure the strictest cleanliness of the catheter.

The bowels.—At the end of four or five days the bowels may act naturally. Usually, however, it is necessary to employ a soap-and-water enema. If this be retained, a second enema may be given in twelve hours, to which an ounce of castor oil may be mixed with advantage. When a soap-and-water enema is retained it sometimes produces a copious red (urticarial) rash.

Temperature.—This should be taken every four hours in the mouth, and be duly marked on the chart. The first reading after an operation is low, 97° or even 96°; it then slowly rises to 100° or 101° without occasioning alarm. As a rule, this subsides to 99° in a few days.

Pulse.—This is a very valuable guide. As long as the pulse remains steady and full it is a sure sign that all is going well. A rapid, thready pulse, running 130 or 140 to the minute, and maintained, is a sure indication that things are not going satisfactorily.

Sutures.—The superficial sutures are removed on the eighth day. Occasionally one of the silk-worm-gut sutures may cause a stitch abscess; in such circumstances it is a great saving of time to remove it. Suture abscesses of this kind usually declare themselves about the tenth day.

When the convalescence has been uneventful, patients usually leave their beds by the twenty-first day.

The invention known as the belt I have discarded since adopting the "triple" method of closing the wound.

Embalming Crushed Members. — The 'Journ. d. Sc. Méd. de Lille,' December 25th, describes the case of a woman eight and a half months pregnant, whose hand had been crushed in some machinery. For several days the hand was plunged for hours at a time in phenicated and disinfected hot water. Then a few whiffs of chloroform were given her and the toilet of the hand accomplished with quantities of very hot water and with solutions of sublimate and potassium permanganate, removing the loose projecting fragments of bone. Small squares of soft gauze impregnated with a poly-antiseptic salve consisting of all the substances currently used in surgery (less of those easily absorbed: sublimate, phenic acid and iodoform, and more of the others, boric acid, salol, antipyrin) were carefully fitted into every crevice, covering the hand entirely, completing the dressing with a thick layer of cotton and a tight, compressing bandage outside of all, to secure anastomosis of the vessels. The patient then left for a maternity, where she underwent a normal confinement. The embalming dressings are never touched for three weeks, leaving to nature the task of separating the dead from the living tissues. When they were removed in this case, after twenty-six days, under a thick layer of a fœtid, chocolate-coloured fluid, the wounded surface was found covered with healthy granulations, with the necrosed parts entirely eliminated. An auto-plastic operation was performed a week later, which healed rapidly.—*Journ. American Med. Assoc.,* Feb. 19th, 1898.

TWO CLINICAL LECTURES

ON

DERMATO - NEUROSES, FROM A NEUROLOGICAL STANDPOINT;

INCLUDING CASES OF

Lesion of the Median Nerve, Hemiatrophy Facialis, Vesicular Eruptions, Skin Lesions in Hysterical Subjects, Prurigo, Chloasma, Wrinkles, Raynaud's Disease, Acroparæsthesia, and Fugitive Erythema.

BY

THOMAS D. SAVILL, M.D.Lond., D.P.H.Camb.

LECTURE II.

GENTLEMEN,—The subject of these lectures is admittedly obscure, and the cases which throw any light on it are rare. However, by the kindness of my friends and colleagues, and the chances of an inexhaustible clinique, I have been able to collect an interesting series of skin cases due to nerve lesions; and you will remember that, in order to introduce some kind of method into our studies, I decided to classify these cases into four groups :—(*a*) Those skin cases where the nerve lesion is situated *in the course of a peripheral nerve* (*mixed or sensory*) ; (*b*) those where the lesion is probably situated in the *central nervous system* (brain or cord) ; (*c*) those where the lesion is to be found *at the end of a centripetal* or sensory nerve; and (*d*) those in which the mischief is located in some part of the *sympathetic nervous system.*

I endeavoured to emphasise the fact that the effects which arise in the skin vary considerably according to the nature of the nerve lesion, that is— to say, whether it be irritative or destructive; and we studied together several cases which proved, in a quite remarkable way, that whereas vesicles and rough wrinkled skin arise in consequence of irritative nerve-trunk lesions, glossy skin with atrophy of the skin and its appendages ensues on paralytic or destructive nerve lesions.

We finished the investigation of those cases belonging to the first two groups, and now we proceed to consider (*c*) skin affections due to *lesions at the end of a centripetal or sensory*

nerve.—It is obvious that the effects of a lesion situated at the end of a sensory or centripetal nerve must travel centripetally, and that they will become manifest either centrally (in the form of some subjective sensation, such as itching), or that they will act reflexly, and their effects will be manifest in some distant part of the skin. Lesions situated here, as elsewhere, may be irritative or destructive.

A destructive lesion situated at the end of a sensory or centripetal nerve will necessarily give rise to anæsthesia. It seems highly probable, as I

ary to an eruption, such as eczema, and then it is due to an inflammatory irritation of the sensory nerve endings. But in cases of simple "pruritus" without eruption, and of "prurigo," it is the toxic condition of the blood in which the peripheral sense-organs lie that gives rise to the sensation of itching.

Here is an elderly man, the subject of that troublesome complaint, *prurigo*, which as you know consists of severe pruritus (itching) *plus* an eruption consisting of three elements,—small, hard, congestive papules nearly always surrounding the

Diagram to further illustrate case of hemiatrophy facialis described on page 319.

have just mentioned, that in *tabes dorsalis* the lesion begins here in the same way as it begins also in the muscle spindles, that is at the ends of the muscle-sense neurons, and many remarkable perversions of sensation are present in this disease.

Under the head of irritative lesions situated at the end of a sensory nerve, and giving rise to central effects, we have the familiar instance of *pruritus*. I have elsewhere* shown good grounds for the belief that pruritus is always due to a blood alteration, except in those cases when it is second-

hair-follicles; a patchy erythematous condition, which goes on to the changes resembling a bruise, and scratch-marks. Careful investigation always reveals in such cases that there is some disorder of the blood, very generally due to some gastro-intestinal disturbance, or something can nearly always be discovered in operation which renders the blood abnormal. This latter condition must of course be treated, but in most cases I have found that calcium chloride, in large doses, will almost invariably give relief; and since publishing that paper I have received abundant testimony confirming this. But the doses must be large, beginning at 20 grs., and

* "Pathology of Itching, and its Treatment by Large Doses of Calcium Chloride," 'Lancet,' Aug. 1st, 1896.

working up to 45, three times a day. This patient has obtained complete relief from 30 grains thrice daily, directly after a meal. Now, calcium chloride has a very marked effect on the blood, and increases its coagulability,* and this is one of many grounds for the belief that pruritus is due to a blood-change. It is much debated in cases of prurigo, which is the primary disorder, the pruritus or the eruption, but there are strong grounds for believing that the itching is the primary, and that the eruption is to a large extent traumatic. The skin and all its structures are doubtless hypersensitive, but it is the rubbing of the patient and the friction of the clothes which certainly produce the scratch marks and erythematous patches and the bruises. Moreover, the rubbing, in my belief, takes most effect upon the hairs, and causes the follicles to rise into papules.

But irritative lesions at the periphery of a centripetal nerve may also be manifest by *reflex effects*, and the case I am about to show you is, I believe, an illustration of this fact. The lady who has kindly come here to-day presents the well-known patches of *chloasma* on the two sides of the forehead and round the eyes. Moreover, although she is only 31, you will observe pronounced *wrinkles* around her eyes and mouth. For some time I was unable to make out the source of these, to her, most objectionable symptoms. But she has a very aggravated condition of granular endometritis, and a small uterine fibroma. The former has recently been treated, and the dark patches on her face have certainly improved since then. She has also another very interesting and rare condition. Her hands, you will observe, are really the hands of an old washerwoman, though she belongs to the class of fashionable society; they are extremely *wrinkled and harsh*. Both hands are alike. The disorder, like the chloasma, is symmetrical. It is difficult to account for this condition, except on the supposition that it, like the chloasma, is due to the reflex irritation from the disturbed uterine functions.†

Here again, gentlemen, we have a wrinkled condition of the skin in association with an irritative lesion, but this time acting in a reflex manner; and how is it possible otherwise than through the nervous system?

In connection with skin conditions due to reflex nerve lesions associated with visceral disease, the researches of Ross, Mackenzie, Thorburn, Head, and others may enable one to identify the position of the originating disease.* These observers have shown, firstly, that the surface of the body may be mapped out into "sensory areas," *i. e.* areas of tenderness, not necessarily corresponding to the distribution of any particular sensory nerve, which lie side by side like the pieces of a puzzle; secondly, that these areas correspond with the different segments of the cord; and thirdly, that each of these areas is probably associated in a reflex manner with the different internal organs. So that an irritative lesion of an organ may sometimes be recognised by tenderness situated in some definite area.

Moreover these areas correspond with the different areas affected by patches of herpetic vesicles (a skin lesion which you will remember is associated with irritative direct nerve impulses) in the different varieties of zona. We know how frequently herpetic vesicles around the mouth are associated with catarrhal inflammations of the lungs; and similarly there can be no doubt that the patches of chloasma in our last patient are associated with uterine disease. Long before these researches, it was known that chloasma in this situation, and across the forehead is a frequent accompaniment of pregnancy in some subjects.†

(*d*) The last group of diseases with which we have to deal are those cases in which we have reason to

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* Wright, 'Trans. Royal Society,' and elsewhere.

† The granular endometritis was treated by scraping, and as the uterine functions gradually improved under treatment the chloasma patches disappeared, and the wrinkles on the face and the wrinkled condition of the hands became considerably less, and finally almost entirely disappeared (June, 1897). In October I was again consulted by her for menorrhagia and a return of chloasma and wrinkles. I found that the uterine fibroma had grown

considerably, and the endometritis had returned. It will, I fear, become necessary to again call in the aid of my gynæcological colleagues. It ought to be mentioned that she suffers from a very intractable dyspepsia, and that there is a marked history of cancer in the family.

* Ross, ' Diseases of the Nervous System.'
   Dr. Henry Head, ' Brain,' 1893, vol. xvi, p. 1.
   Dr. James Mackenzie,   ,,   ,,   ,,   p. 321.
   Dr. Wm. Thorburn,   ,,   ,,   ,,   p. 355.

† I believe pigmentary disturbances to be more intimately associated with toxic conditions of the blood— such as arise in chronic constipation, gastro-intestinal derangements, and germ disorders—than with nerve derangements; but have purposely avoided reference to this aspect of the matter on the present occasion.

suspect some *disorder of the sympathetic nervous system*. These constitute the most difficult, and yet perhaps the most fascinating of all the different varieties.   It is chiefly in the vascular disturb-ances of the skin (vaso-motor conditions, or angio-neuroses) that lesions of the sympathetic system become manifest. The sympathetic system possibly conducts trophic influences to the skin, a subject which was briefly referred to under central nerve lesions, in connection with the interesting case of T. M—. However, in this place we must confine our attention to the vascular changes. As you are aware, physiologists state that every peripheral nerve contains different vaso-motor fibres which have opposite effects, vaso-constrictors and vaso-dilators, the former being the most numerous and powerful ; so that when a nerve is cut the vessels of a limb dilate, and if the distal end be stimulated electrically the vessels contract.

Raynaud's disease, acroparæsthesia, fugitive erythema, other kinds of erythema, and giant urticaria are some of the affections belonging to the group under consideration, and I propose to briefly study some of these cases with you.

This patient, who is suffering from *Raynaud's disease*, is now 25 years of age. She was under the care of Dr. Fletcher Little in the Temperance Hospital, and was exhibited by him at the Clinical Society. She is of a somewhat nervous tempera-ment, and complains of pain in her hands, which, she says, is of a burning and fiery nature. She never noticed anything wrong until her eighteenth year, when she began to suffer greatly, she states, from attacks of coldness in her fingers and toes, which at times became very white as far up as the second phalanx. Both her index fingers were at first specially involved, but by-and-bye the other fingers were affected. I want you to particularly bear in mind that they were white, not red, for at that time these attacks of angiospasm were not suc-ceeded by the reactionary dilatation ; these attacks she ascribed to her occupation, which was that of florist's apprentice. In the course of the next two years her symptoms gradually got worse, and they extended to all the other fingers of both hands, excepting the little fingers. All the pha-langes of the affected fingers became very much worse on the slightest exposure to cold, and now, at the conclusion of the attacks, they assumed a dark purple colour. At the age of twenty-one her

fingers had become so bad that she had to give up her work ; and it was at this time she noticed, one day, that two black spots had formed, one at the tip of each index finger. These finger-tips "ulcerated and fell off," and the wounds were very slow to heal. The thumbs and other fingers, with the exception of the little fingers, subsequently became involved in a similar way, the corresponding digits of the right and left hands being affected simultaneously. During this process she had a good deal of pain, and she says that the points of her fingers felt as if they were "on fire." When the ulcerated points healed there was considerable loss of tissue ; and now, you will observe, the affected digits are much shortened, and the nails are very small. There have never been any similar lesions on the feet, but they have always been subject to the same attacks of coldness. She has suffered from time to time from erythematous blotches on the arms, and at the present time there are small bruise-like patches on both legs. She has lost flesh, but lately she thinks her hands have got a little better. You will notice little purple patches on the face, which are very apt to appear in these cases. Another condition present in this case, which is not unusual, is the smooth and stretched appearance of the skin.

The entire integument of the body and limbs is dry and harsh, is scurfy and cracked in places, and is atrophic—a condition not infrequently asso-ciated with Raynaud's disease. The skin of the face appears stretched and shiny.

This, gentlemen, is a very typical case of Raynaud's disease. The symptoms which belong to this disease are six in number : first, a general emotional and nervous condition ; secondly, the local condition of the extremities,—*i. e.* attacks of pallor followed by a purple condition, and this by sloughing and gangrene ; thirdly, crops of livid erythematous patches on different parts of the body, such as those you see. There may also be, fourthly, paroxysmal hæmatinuria ; fifthly, attacks of intermittent pyrexia ; and sixthly, in some cases, effusion into the joints. This patient has had the first three ; she may have had the fifth, but not the fourth, nor has she had actual hysterical seizures, though she is highly nervous. Consider, gentlemen, for one moment what strong points of resemblance these cases have to those cases alluded to under

central nerve lesions which take effect through the sympathetic system !

The next case I will show you is a woman the subject of *acroparæsthesia*, a milder disease, but certainly allied very closely to Raynaud's disease. Acroparæsthesia is a very appropriate name for what I believe to be a fairly common condition, though it is not described in the usual text-books. At the present time I have ten or eleven cases under my care at the Nerve Hospital. When occurring only in slight degree such cases are often overlooked. This patient's age is 52, and for nearly eighteen months she has had attacks (at first seldom, but more frequent latterly) commencing with pins and needles in the fingers, going on to acute pain of a burning character, accompanied by redness and swelling of the hands, completely preventing sleep, and attended by so much swelling that she could not close her hands. At first the attacks only came on at night, and she had intervals of freedom, but recently her hands have been almost continuously bad. She is extremely emotional, and trembles all over at the slightest excitement, though the climacteric occurred three years ago.

This disease has the following characteristics. Its principal manifestation consists of attacks of coldness and pins and needles in the extremities, with other curious and indescribable sensations in the hands, and less frequently in the feet, Sometimes these attacks are brought on by exposure to cold, and very often at night-time when the circulation is normally less active, and the patient happens to put the hands out of bed. The attacks consist at first of a very transient stage of pallor, due apparently to spasm of the vessels, followed immediately by dilatation and congestion of the parts, of a more lasting character. The stage of pallor may be so brief as to be overlooked, but the whole attack lasts from a few minutes to a few hours. I am showing you the most exaggerated case I have, where at one time the attacks lasted for twenty-four or forty-eight hours at a time, and the patient was laid up for two months. I have several others with slighter manifestations. All are females with one exception, and all but three are by occupation seamstresses. The patient before you does a lot of household washing, which makes her hands worse. All have derived considerable relief from nux vomica, combined with bromide of ammonia, or galvanism.

The next case I want to show you is an example of that extremely rare condition, *giant urticaria*, or Quincke's disease. This patient, who is 34 years of age, was suddenly seized five years ago with an irritation of the front of the abdomen, accompanied by what she describes as "small white lumps in clusters, about the size of peas." These subsided, but they have recurred, and latterly she never passes a day without an attack on some part of the body. They come on apparently without cause. Quinine, arsenic, and other things failed, but she has obtained some relief from hydronaphthol ointment. She is under the care of my colleague, Dr. Eddowes, who has very kindly sent her here to-day. The eruption is very fugitive, coming in attacks which last at most for a few hours, and then disappear spontaneously, but fortunately you are able to see some of the lumps. You will see some œdematous whitish or pinkish swellings on the inner surface of the arm. On the face also are some blotches, and the feel of those on the forehead is very characteristic. They occur on any part of the body, face, or extremities; and not only on the skin, but also on the mucous membranes, and in that position they may give rise to a good deal of danger by swelling around the glottis.

The disease belongs to the group urticaria, and like that condition is generally associated with gastric disturbance. Severe vomiting and diarrhœa are sometimes present also, and it is possible that these are due to the same lesions occurring in the intestinal canal as you see on the skin.

There are a large number of vaso-motor phenomena, of which I might have shown you many illustrations to-day, but I must content myself with two cases of *fugitive erythema* and one of *hyperidrosis*.

This patient is the subject of fugitive erythema, which attacks her across the front of the face. "Fugitive facial erythema" is a disease consisting of attacks of congestion situated most usually on the nose and across the face in a "bat's-wing distribution," and seems to be really a preliminary stage of rosacea. Sometimes, when the disease progresses, and becomes permanent, it passes into a condition indistinguishable from rosacea. One of my patients, a girl of 16, has erythematous blotches on the arms and legs during the attacks of facial erythema. I show you this

particular case to-day because it illustrates the value of calcium chloride in large doses, which I have found very useful in such cases. I began to try this remedy in August of last year, and have used it altogether in seven cases of fugitive erythema and three cases of rosacea. It certainly relieves both conditions while the patient is under the treatment. How far the relief is permanent it would be premature to decide, but in three cases there was no return, after ceasing the remedy gradually (as should always be done), for some months. This patient has taken 20, gradually increased to 25 grains three times a day directly after meals (another necessary precaution). Larger doses than these have not been required, though the remedy may be increased to 40 or 50 grains four times a day. Besides calcium chloride, bromide is nearly always indicated, and gives great relief from the nerve symptoms.

She has only had one attack during the last fortnight, whereas they appeared nearly every day before. These attacks are worse after meals, and worse at the catamenial periods; nearly all erythemata have these tendencies. The disease is almost entirely confined to females, either at the evolution or involution of the sexual functions, showing that there is a large nerve element in these cases, though, on the other hand, the relief by calcium chloride indicates some blood alteration. Moreover, these patients nearly always show other signs of nerve disturbance in the shape of attacks of tremors, faints, "nervousness," and so on.

The flushes which patients so often complain of at the menopause belong to the same category as the erythemata under consideration.

All of the foregoing are vaso-motor disturbances of a more or less general character, but I should like to show you one case which is apparently due to a localised lesion of the sympathetic nervous system, viz. the cervical ganglia.

The patient is 29 years of age, and he suffers from a most curious malady. For the last four or five years he has had attacks (which came on occasionally at first, but lately have been very frequent) of *perspiration confined to the left side of the face*. At first they only came on when he took pepper or spicy things, but latterly when he is looked at or gets nervous he gets flushed, and the perspiration comes on. It never affects

the right side, and perspiration is sometimes so profuse that it collects beneath the eye, and drops down the face. The left side of the face is a little more puffy than the right side. That these curious symptoms are due to some disorder of the cervical sympathetic is evident, and it is probably of an irritative kind, but the cause and nature of the lesion are very obscure.

Belonging to the same category as the erythemata we have been considering, there is also a very interesting series of cases which were published by Dr. Bolton Tomson, of congestion and various other angioneuroses.* I would also refer you to the writings of Charcot, on the *œdème bleu* which occurs in hysterical subjects,† and others.

Let us, in concluding this subject, consider for a moment the *features which the various "vaso-motor cases"* we have been examining *possess in common*. In the first place, in all of the symptoms, no matter of what kind they may be—erythema, pallor, flushing, congestion, hæmatinuria, &c.,—all are paroxysmal; they come on in attacks of shorter or longer duration, and pass away only to return again after an interval of varying duration. Now you will observe that this periodicity is a characteristic of the contraction of involuntary muscular tissue. I do not think that this rhythmical or periodic character of involuntary muscular action is sufficiently realised. The peristalsis of the intestinal canal, and the uterine contractions, reveal this character; and the same spontaneous periodic contraction and dilatation of the arterioles may be observed in animals. This periodic character of the symptoms in certain diseases helps us sometimes to identify the kind of disorder with which we have to deal. It shows us also that we have to do with a defective function in the middle coat of the vessels, either in the direction of excess or diminution; and, the function of this tissue being controlled by the sympathetic nervous system, it is here we must look for the defect, or in the central nervous system which controls it.

The *second* feature they all have in common—or all but the last case—is symmetry of distribution. This seems to point to the fact that the disturbance, whatever it may be, is centrally situated; that is, is in the brain or cord, inasmuch as the sympathetic

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* 'Lancet,' Aug. 15th, 1892.
† 'Leçons surs les maladies du Système Nerveux.'

ganglia are found in pairs,—one set for each side of the body.

A *third* feature is that each attack consists of a first stage of pallor, though often so brief and transient as to be unnoticed by the patient, which corresponds to contraction of the arterioles, followed by a second and longer stage of dilatation. Moreover, this latter stage is accompanied, strange to say, not by an increased flow of blood through the part, as usually happens when the arterioles dilate, but by a blood-stasis, and often increased transudation even of red blood-cells, which leave the stains as of a bruise. I confess that this blood-stasis puzzles me not a little, but there is the fact. In cases where the first stage of angio-spasm is very marked, as in Raynaud's disease, gangrene of the parts may ensue. The pains, burning and tingling, and other subjective symptoms which accompany these attacks, are possibly due to the pressure on the sensory nerve endings by the dilated vessels, or in the first stage to the actual coldness of the bloodless tissues.

Fourthly, the symptoms always have a marked tendency to affect exposed parts, such as the face and hands, and the parts at the extremities of the limbs, such as the feet. The attacks are, moreover, in the early phases always determined by cold. These features are readily explained by the mechanism of the circulation, and the vaso-motor susceptibility to cold. Raynaud's disease is nothing more nor less than an exaggerated sensibility to cold; and you will notice that in cases of Raynaud's disease the feet, which are covered, are always less affected than the hands.

Fifthly, females are far more often attacked than males by these disorders; and they almost invariably exhibit signs of general nervous irritability, such as those which have been mentioned. This, again, points to a disturbance of the central nervous system—the brain or cord,—and, moreover, that the disturbance is of an irritative kind, and of a kind we call functional, because with the present means at our disposal we cannot identify any gross lesion.

It is not possible on this occasion to draw analogies between these various vaso-motor conditions and the cases alluded to under *central nerve lesions* (*b*).

Time presses, and I must leave many interesting topics for a future occasion; but in conclusion we must briefly consider the general principles which should guide us in the *treatment* of these cases. And first, whether the lesion be situated in a nerve trunk or the brain or the sympathetic system, provided it be of an irritative nature, I cannot too much insist on the value of complete *rest* and complete cessation of function. Long ago this was insisted upon by Hilton in that classical work of his, 'Rest and Pain,' and it certainly has a more marked effect than any other method that I know of. In the case of the first patient I showed you, absolute rest—absolute rest in a splint for many months—was of the greatest use for the pain, which came on when he first used his arm, owing to the tension between the ends of the nerve. For cases of neuralgia it is also invaluable, and I have in this way cured several cases which have baffled many other plans. Sometimes it may with advantage be combined with over-feeding and massage—and this has already done the lady with chloasma some good,—but complete rest alone is a sovereign remedy for all irritative states of the nervous system. Bromides and other sedative remedies are useful to promote this end by increasing sleep and calm.

We have seen that *vesicles* may be regarded as indicating an irritative lesion of the lower neuron, and here again rest is of value. For the neuralgia which accompanies herpetic affections complete rest, and bringing the patient completely under full doses of bromide, is one of the best plans. Quinine in big doses is sometimes useful, and galvanism has been tried, but I have rarely found it beneficial. For the vesicles themselves nothing can be done but painting with collodion.

For *reflex cases* in which the cause is some reflex source of irritation, of course, this must be removed before one can hope to cure the chloasma, wrinkles, wasting of the subcutaneous tissue, and so forth.

For *pruritus,* calcium chloride is, as previously mentioned, a valuable remedy, whether the itching is secondary to a skin lesion, or whether it is primary. Warm baths, especially warm tar baths are useful adjuvants.* Administered at night, they often procure a good night's rest.

Then we come to the *vascular lesions,* for which

* A small teaspoonful of creolin to 15 gallons of water at a temperature of 98° F.

a good deal can be done, excepting, perhaps, in Raynaud's disease, when the disease is fully established. Nux vomica and quinine are the best tonics I know, and I use the word tonic here in the appropriate sense that it gives tone to the vessels. There is no doubt that where there is dilatation of the vessels, indeed, in all congestive disorders of the skin, quinine in large doses is often of great service, and so is nux vomica. The latter is *par excellence* the remedy which gives tone to the involuntary muscular fibres, and it is of the greatest use in cases of acroparæsthesia. It may advantageously be combined with bromide of ammonium for the general nervous irritability in these cases.

Of course one must correct any fault there may be in the blood. In urticaria, for instance, you know it is necessary to clear out the intestinal canal with magnesium sulphate or some other saline purge.

When there is mainly *contraction* of the vessels I believe galvanism is a very valuable remedy. I have not had very great experience of this remedy in vascular disorders, but in those I have tried it, where the patient will come up regularly, and a current of sufficient strength be applied sufficiently often, galvanism has been the means of giving complete and often permanent relief. For instance, in cases of "dead hands," which I have not had time to mention to you. This symptom arises in persons apparently in perfect health; the hands go perfectly white and cold without the slightest reason, and even in hot weather. I have relieved two such cases by galvanism down the forearms for a quarter of an hour daily, using large rheophores and the strongest current possible.

In Raynaud's disease I believe, inferentially, this same line of treatment might be successful, especially for cases seen in an early stage. In acroparæsthesia, which has so many points of resemblance to Raynaud's disease, I found in three cases that the condition by two weeks' steady treatment was entirely relieved. There is another form of electricity which I believe would be worth a trial in Raynaud's disease, viz. static electricity. I have known it produce certainly marvellous relief in some cases of vascular spasm, and I should certainly recommend its use in the other, more formidable, affection.

The whole subject of dermato-neurosis is admittedly obscure, and I have really only touched the fringe of it to-day. Many more interesting topics have not even been referred to, such as the pigmentation or leucodermia associated with tabes dorsalis and neuralgia, and the distribution of the skin affection in certain cases of morphœa nigra and alba. These must be deferred. It has, however, been my aim to avoid, on the one hand, laying before you any misleading hypotheses or high-flown theories; but, on the other, to give you some definite facts, which will, I trust, enable you to draw practical lessons for yourselves.

Catheterisation of the Male Ureters.—

Some weeks ago Dr. Howard Kelly, of Baltimore, gave an interesting demonstration of his method of catheterising the male ureters, in Dr. Abbe's clinic at St. Luke's Hospital in New York. The patient was a man with supposed renal calculus. He was etherised, and the straight endoscope was inserted into the bladder while he was in the dorsal decubitus. Then he was raised to the knee-chest position, and it was found to be thoroughly practicable to inspect all parts of the bladder illuminated by light thrown from an electric head illuminator. The ureteral orifice was readily demonstrated to several of those present, and then the long flexible catheter with its stylet was instantly passed in and onward nearly to the kidney. The endoscope being withdrawn and the patient returned to bed, the urine began to flow in a few minutes, and after two test-tubes full were obtained the catheter was withdrawn. Had it not been for the time occupied in demonstration, the entire procedure would not have consumed more than four or five minutes. The value of the knee-chest position is that what urine remains in the bladder falls down toward the internal meatus and leaves an unobstructed field for study. Dr. Kelly demonstrated also that when the prostate is enlarged, and that portion of the canal is tortuous, the straight endoscope can hardly be passed beyond the prostate, so that this method of ureteral catheterisation is not feasible in all subjects. The operator said that this was the last demonstration he expected to make of this method, since it was outside his especial field, and he left it therefore to be developed by the general or genito-urinary surgeon.—*Medical Record*, February 19th, 1898.

DEMONSTRATION OF CASES

At the North-West London Clinical Society.

Dr. HARRY CAMPBELL in the Chair.

Diagnosis between Fractures and Sprains.

DR. BOULTING said he brought a case to raise a discussion as to the reason of the frequent mistake being made between fractures and sprains. The patient came to him on the 12th of October, and a skiagram was taken sixteen days later. Two hours before he was seen, the man had fallen on his right hand; there was a little swelling in the wrist, but no deformity; and it was found that the patient could pronate and supinate, though the effort caused him pain. He, Dr. Boulting, did not feel satisfied that the case was one of sprain, and therefore asked Mr. Shenton, of Guy's Hospital, to take a skiagram, which he now exhibited. It showed a distinct fracture of the radius and of the styloid process of the ulna, the former being of a serrated character. At one time it was supposed that the deformity of Colles' fracture was produced by muscular action, but it was shown in 1865 that the majority of these cases are really impacted fractures; that by a momentary continuance of the initial force which produces the fracture the shaft of the radius is driven into its carpal end, and gets impacted towards the palmar surface. Nevertheless some of the deformities must be due to muscular action. He suggested that in the present case, and perhaps in many other instances of serrated fracture, the fragments were dovetailed; and if the initial force was insufficient to separate the fragments, and if the muscular pull on them afterwards was not very great, they remained interlocked, though not impacted and without deformity, and could be practically treated as sprains. It would be found that in the skiagram of the present case there was already the evidence of a callus. He treated the case throughout as if it were a sprain, putting the wrist up in a stiff plaster and bandaging tightly.

Mr. MAYO COLLIER agreed with Dr. Boulting's remarks as to sprains being frequently fractures, and that they were often overlooked as such, with consequent impairment of function for a considerable time. His practice was to put up all severe cases in splints and treat them as fractures, keeping them immobile for ten days to a fortnight, and such treatment always resulted in success. He agreed with Dr. Boulting that this was a case of Colles' fracture produced in the usual manner, namely, by a fall forwards, the force being exerted in an antero-lateral direction. In this case there had been a fracture, and the parts had sprung back into position. That which could be felt after two months had elapsed was pathognomonic of fracture, namely, a large amount of callus between the bones; that callus remained for a considerable time, producing considerable impairment of rotation, and pain on movement.

Dr. BOULTING, in reply, said it was his practice in cases of sprain of the ankle to let the patient put his foot to the ground and hobble along, simply strapping the joint with the addition of a tight bandage. He had not found that any adhesions formed, and the result was speedily satisfactory.

Extensive Tubercular Arthritis of Elbow.

Mr. JACKSON CLARKE showed a young man who was sent to the hospital by Dr. Boulting, the subject of a tubercular arthritis of the elbow, which had been smouldering for some years. Two and a half months ago Mr. Clarke excised the joint. Already the patient had got more power in his grip, and the biceps muscle was improving. As the patient's hand was usually hanging down in the day, he, Mr. Clarke, devised for night use a splint to stretch the ligamentous fibres over the posterior part of the joint, and to increase the flexion. There was no trace of any return of his old trouble. There was a subcutaneous collection of tubercular matter, which he evacuated before the final operation. In the final operation he made a median and posterior incision, removing the lower end of the humerus, including the two epicondyles and the upper end of the radius to the tuberosity, and the whole of the articular surface of the ulna, i. e. the olecranon and the upper end of the coronoid process. The whole of the synovial membrane was destroyed, and a considerable extent of the articular surface of the bones.

Mallet or Drop Finger.

Mr. JACKSON CLARKE showed a woman the

subject of "drop finger," who had been brought to him by Mr. Allen. When the patient first came the terminal joint of the little finger dropped at a right angle when the remainder of the finger was held straight out. The history was that there had been but slight pressure applied to the finger—simply rubbing the two ends loosely together,—after which she found she had no power in the end joint. It was very rarely that the extensor tendon had been torn in these cases. The surgeon who first saw the patient cut down to look for the rent in the tendon, but as he found it intact he very properly closed the wound again. All that was necessary was first to put on a light splint, such as the one he had devised, and which the patient was wearing. At present the finger was quite straight, but he intended to keep it in the splint a little longer. In most of these cases there was interstitial stretching of the fibres of the extensor tendon, but in a few cases the tendon might be ruptured. He found that in the present case there was a basis of gout, and he felt sure that the tendon had been weakened by previous gouty inflammation. He had found gout entered into many of these cases.

Hallux Rigidus.

Mr. MAYO COLLIER showed a boy the subject of this condition. He said the subjects of hallux rigidus were usually persons below the age of twenty, whose vitality, as a rule, was below par, as evidenced by their cold extremities. Flat-foot was almost invariably associated with this condition, of which hallux rigidus he considered was a sequel. Hallux rigidus was known by the fact that the proximal phalanx was stiff in the joint between that and the metatarsal bone. Pressing the toe upwards caused pain, but pressure in the opposite direction caused no discomfort. Associated with the condition there was flexion of the metatarsal bone on the internal cuneiform bone. The joint itself was invariably larger in circumferential diameter. He had operated on a large number of such cases, and found in every case that it was due to pressure caries between the sesamoid bones and the under aspect of the head of the metatarsal bone. In advanced cases the whole joint was invaded by granulation tissue, and practically disorganised. His experience was that the only effective treatment was to make a longitudinal in-cision, taking the head of the metatarsal bone right off, and leaving the phalanx alone. The cases healed up by first intention in a few days, and excellent results ensued.

Mr. JACKSON CLARKE said that when the cases could be seen in an early condition, by curing the flat-foot the case could be cured by relieving the over-pressure in the first joint. He would be inclined to treat the present case first by having a properly made boot for the patient, and putting on a valgus pad of india-rubber in the proper position, and a leg iron so as to keep the foot in a slightly inverted position.

Pelvic Disease in Women the Subjects of Hereditary Syphilis.

Dr. JOHN SHAW-MACKENZIE communicated notes on this subject. He thought all must have met with cases of pelvic disease in women, for which there was no apparent origin. The patient from whom the present notes were taken had had no gonorrhœa, no sepsis, and, in fact, was a "virgo intacta." She had marked cicatrices over the face, at the angles of the mouth and nose, which were attributed to an eruptive condition when she was an infant. At the present time she has very well-marked notched central upper incisor teeth ; she was suffering from leucorrhœa and backache. He had met with several cases with suspicious teeth, and suggestive history of syphilis in the parents of the patient, some of them being single women and others married ; some of the latter were sterile, and others had had abortions. Those who had had conceptions had very well-marked pelvic disease. He thought such cases, initially due to hereditary syphilis, aggravated by marriage and conception with probable transmission through the mother to the third generation, were more common than was supposed. Authorities in the past recorded similar cases, and attributed them to "strumous inheritance." He, moreover, believed the acquired syphilitic origin of pelvic disease in parous women had been largely overlooked, but that it was deserving of attention. As regarding the question of immunity of mothers who bore syphilitic children, he (Dr. Mackenzie) considered the usually accepted estimate too high. It was curious that the syphilitic origin of pelvic disease was rarely mentioned at the present day, for he considered few mothers of syphilitic offspring

escaped some subsequent uterine, ovarian, or tubal disease. In conclusion Dr. Shaw-Mackenzie read an extract from a contribution on the subject by James Whitehead, Obstetric Physician to the Manchester Lying-in Hospital in 1851, in which that authority stated that secondary and tertiary syphilis could be conveyed from father to mother, and mother to offspring, without any necessary outward manifestation of its presence in one or the other of the parents; but non-existence of the disease in the mother had been thought to be the fact, from the oversight in neglecting to examine the uterus in such cases. Dr. Shaw-Mackenzie said he agreed with that pronouncement. He would lay stress on the fact that (1) patients the subjects of hereditary disease, to whom he was now especially referring, had recurring sore throat, falling out of hair, leucorrhœa, menorrhagia, and pelvic inflammatory disease, and sometimes characteristic Hutchinsonian teeth, while marriage and conception aggravated the pelvic trouble; (2) sisters sometimes presented similar symptoms; (3) the mother of the patient has suggestive history of abortions, premature births, dead children, possibly " floodings," and "puerperal fever;" (4) there is positive or suggestive history in the father of the patient, and none in the husband. He thought it was especially difficult and undesirable to inquire too much into histories in such cases, but he thought pelvic disease of hereditary origin in the mother explained certain cases in the absence of disease in the husband.

NOTES, ETC.

TREATMENT OF DELAYED RESOLUTION IN PNEUMONIA.

By Alfred Stengel, M.D.

In discussing the treatment of delayed resolution it is well to recognise that several causes contribute. These I may enumerate as excessive exudate, poor aëration of certain areas, feeble circulation, and to these may be added general enfeeblement of vitality.

Various remedies have been suggested, and different authors have regarded this or that drug

as most efficacious. For my own part I am convinced that no form of medicinal treatment is particularly useful. I have employed tonics, stimulants, arsenic, and iodide of potassium and ammonium repeatedly in the above reported cases, or in others not here recorded, without observing the slightest effect. Stimulants seem to me most rational, but I cannot say that they have ever in my experience done good by themselves.

Counter-irritation has, however, been of apparent benefit in every case in which I have made trial of it, and generally in proportion to its severity. Strong mustard poultices have sometimes been useful, but blisters were always more efficacious. I have never used the actual cautery, though I should be tempted to employ it in some cases. The action of counter-irritants might be explained in two ways: they certainly lead to increased respiratory movements for a time, and if repeated may effect a continuous beneficial effect of this kind; in the second place it is not impossible that they affect the circulation in the lungs. Caton, in a discussion some years ago before the Pathological Association at Oxford, claimed to have demonstrated that counter-irritation of the skin of the chest affects the pulmonary arterioles profoundly. This claim, of course, requires confirmation, but there is abundant clinical evidence of a reliable kind to show that external counter-irritation influences deep-seated structures or organs. Most probably such influence is exerted by reflex action through the nervous system.

Next to counter-irritation I should rank systematic breathing exercises, either in the form of deep inspirations and expirations, or of exercises with bottles after the method suggested by James for the treatment after evacuation in cases of empyema. Adequate breathing would perhaps properly rank as the most important requisite for speedy resolution, but in cases of marked consolidation has disadvantages, such as the tendency to exhaust the patient, and the lack of expansion of the affected side, rendering the breathing useless. In cases, however, of moderate consolidation or persistent broncho-vesicular breathing after pneumonia, I should rely upon breathing exercises rather than counter-irritation. In one case under my care, in a young man of about nineteen or twenty, recovery from the active manifestations of the disease occurred normally, but for some time

there was persistent semi-bronchial breathing with some dulness. He was directed to exercise his respiratory muscles twice daily, and soon began to improve. His chest expansion increased greatly, but he did not recover completely for a year. Pleural thickening may have had some part in the behaviour of this case, but I could never assure myself of its existence.

In one of the cases reported I employed a rather unusual form of treatment, first suggested by Fochier ('Lyon Médical,' August 23rd, 1891). This observer, noting that the occurrence of local suppuration in puerperal fever is often followed by improvement, suggested that artificially induced suppuration might benefit cases of puerperal sepsis. He practised injections of turpentine (about one centigramme per dose), giving three or four injections in different places. Following a suggestion of Fochier that the same form of treatment might be of use in non-pyæmic diseases like pneumonia, Lepine ('La Semaine Médicale,' February 27th, 1892) practised it in a case of pneumonia on the twelfth day when the patient was in a desperate condition. Recovery ensued, and was seemingly largely the result of the treatment. Subsequently Dieulafoy, L. Bard, Gingeot, and Raoul reported successful cases, while Rendu referred, in discussion of one of the papers, to three cases that terminated unsatisfactorily. Two of these, however, were moribund when the treatment was instituted, and the third was a bronchopneumonia and not croupous.

I have not myself employed this treatment in the class of cases in which it was recommended— that is, in pneumonias of severe character during the latter period of the process (grey hepatisation), —and cannot speak of its usefulness in such cases. The instance above reported was one in which there was no immediate danger to life and no existing toxæmia. Fochier advanced the theory that the artificial abscesses operate by "fixing" the toxic substances (*abscess of fixation*), but Chantemesse and others believe the beneficial effect to be somehow connected with an increase of phagocytic activity on the part of the leucocytes of the blood. Without entering into this matter I may call attention to the remarkable change in my case in the differential counts of the leucocytes before and after the injection of turpentine. The number of eosinophilous cells and of polymorphous

forms was of particular interest. The rapid increase of the latter may furnish some ground for the assumption that an increased phagocytic activity is induced, but my own view would take a different form. I am convinced that the phenomena of leucocytosis are largely the result of altered distribution of leucocytes and not of increased production. It has been demonstrated that in the process of hypoleucocytosis the white corpuscles became arrested in the capillaries of the lungs, liver, and other structures. Reversely, it is likely that leucocytosis is partly, at least, the result of a liberation of leucocytes from various parts of the body. In such a case as I have reported, it is not improbable that large numbers of polymorphous leucocytes remained within the pulmonary circulation until a more powerful chemotactic influence caused their liberation. It may be that the treatment is beneficial in this manner.

Briefly, my conclusions regarding the treatment of cases of pneumonia with a tendency to delay of resolution are—

1. In cases of slight tendency to delay of resolution, manifested by moderate dulness and persistent broncho-vesicular breathing, systematic breathing exercises are of the greatest importance.

2. When considerable dulness persists, active counter-irritation should be practised and tonics and stimulants administered.

3. The production of aseptic abscesses may be useful. The cases in which this has been practised are too few to warrant absolute conclusions, and the treatment is too painful for general application.

Therapeutic Gaz., Feb., 1898.

The question of deciding on a palatable food for invalids and children is a matter of considerable importance, and a successful solution of the problem has been found by the Frame Food Company. In regard to composition the Frame Food Diet is remarkable as being the result of a process incorporating into cereal preparations easily soluble phosphates,—a distinct advantage obviating the waste of valuable ingredients otherwise thrown away in the bran. A detail which doubtless also makes for the success of this production, is that about half of the material is soluble in cold water, rendering the composition reliable as a means for ready assimilation.

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* Specially reported for The Clinical Journal. Revised by the Author.

A POST-GRADUATE LECTURE

Delivered at the West London Hospital,
February 2nd, 1898, by

McADAM ECCLES, M.S.Lond., F.R.C.S.Eng.,
Assistant Surgeon to the Hospital, etc.

GENTLEMEN,—The subject of our discussion this afternoon is emergency operations. One member of the class suggested to me that this might be a subject of some interest, but I hope you will bear with me if I say what is comparatively simple, because the operations which one usually has to do in emergencies are fairly simple ones, and in the nature of things do not require elaborate preparation. The cases we shall consider to-day brook no delay, and in all of them practically operation is indicated.

There are four classical surgical emergencies :— asphyxia, hæmorrhage, intestinal obstruction, retention of urine ; and to these may now be added a fifth, cerebral compression. Time will not of course permit me to enter into any of them at great length, therefore I shall confine my attention to some salient points of each.

First of all, asphyxia. Any tube in the body may have its lumen obstructed in one of three ways :—by compression from without ; by obstruction from some substance within the tube ; or by some thickening of its own walls, which thickening in the larger number of cases is due to inflammatory products or new growths. These may be very well illustrated in the case of the trachea, which perhaps is the tube which is most commonly to be dealt with in surgical asphyxia. Pressure on the trachea from without may be caused, for instance, by a thyroid tumour ; or it may be blocked by a foreign body which has been inspired, such as a pea or bean. In the latter case a bronchus is more frequently blocked than the trachea. Lastly, the trachea may be considerably narrowed by its own walls being thickened, such as by the deposit of membrane in a case of

diphtheria. Any part of the respiratory tract may be thus occluded, and the rational treatment in such a condition would obviously be the removal of the cause of the obstruction. Unfortunately, however, such a manœuvre is sometimes impossible, or would take too much time, for the patient is dying for want of oxygen. Failing to be able to get rid of the cause, how can we overcome the effects of the blocking? If the obstruction occurs anywhere high up in the tract, a simple way is to make an artificial opening below the site of the obstruction. This may take the form of one of the following operations:—Tracheotomy high or low, laryngotomy, or laryngo-tracheotomy. Tracheotomy is the usual operation. Laryngotomy is an operation which may be done in the adult very rapidly indeed. In laryngo-tracheotomy the incision is partly in the larynx and partly in the trachea. The operation is most suitable for children, and particularly in young children. To-day I shall only discuss high tracheotomy, that is above the isthmus of the thyroid gland. This operation has to be performed in an emergency, often without adequate assistance and without a plethora of instruments, and very likely in a house in which there is a great deal of confusion. It is true that a surgeon's resources will be tried to the very utmost in many of these cases, but I purpose to only lay before you the main facts. First of all, the instruments essential for this operation are those I have laid on the table, namely—

A scalpel, which should be sharp, as nothing is so irritating when one wants to get through the skin and tissues quickly as a blunt scalpel.

A pair of dissecting forceps. These may be used not only for holding the tissues as they are incised, but also in certain cases for dilating the trachea. They should have a good spring.

Several pairs of pressure forceps, which are so useful in temporarily arresting hæmorrhage.

A pair of blunt hooks. Perhaps these are not essential, but they are very easily made. They can be evolved out of a hairpin or any other body of that nature which is bendable. You will see that the proper blunt hooks have probe points, and they do no harm to the tissues. They are useful partly as retractors of the superficial tissues, and partly as instruments for holding the trachea open.

A trachea dilator is not always indispensable,—

that is to say, you can dilate in various other ways.

A proper sized tracheotomy tube should be at your command if possible; also a pair of scissors, and feathers.

Possibly one may be in such a position as to be without even the above instruments, and then necessity becomes the mother of invention. All the instruments used should be scrupulously clean, and if possible should be boiled just before use. Very often in a sick room you will find a kettle on the fire, and it is well to drop your instruments into the kettle and let them boil for a short time.

Now what preparation of the patient for the operation should there be? Time will not allow of anything elaborate, but the following points may prove useful.

All clothing should be loosened at once; I think that is a most important point, particularly in view of the possibility of having to perform artificial respiration. Then the neck should be washed over with soap and water. The necks of such patients as I have in my mind have frequently been poulticed with linseed meal, and that is one of the most septic materials we can have. If any be at hand, an antiseptic should be used for the skin. Spirit of wine is often in a house, and is a good emergency antiseptic to use. The patient, especially if a child, should have the arms bound to the body by a towel or shawl wrapped round the upper part of the trunk. This can be instantly removed if necessary for artificial respiration.

What position should the patient be placed in, and what position should the surgeon assume? The patient should be placed in the dorsal position on a table, in a good light, preferably in front of the window in the daytime; but you must avoid putting the table in such a position that you have to stand between the window and the patient. If at night, it is necesssary to get close to the artificial light in the room, taking care of course again not to get into your own light.

The neck should be extended as far as possible, so that the structures in the middle line become tense, and possibly the superficial veins slightly emptied. This latter is a point worth remembering, because one does not like to see one of these big veins bulging up as soon as the skin incision has been made. The head must be kept in the middle line, so that the chin and sternum

remain in the same line. The operator should always stand on the right side of the patient.

As to the operation itself, the first thought is, should an anæsthetic be given ? I say yes, certainly, if you have it at hand. A little chloroform further dulls the child's already diminished sensibility, and it also to some extent helps to overcome the spasm of the glottis which is so often present in these cases. I suggest that even if one is single-handed, a little chloroform may be given. Of course if the child is completely unconscious and in a state of asphyxia, no anæsthetic is needed. There is no doubt that cocaine, or what is better and safer, eucaine, is beneficial, but neither may be at hand. Then make an incision in the middle line, starting from the lower border of the thyroid cartilage. In a fat infant, in my experience, the thyroid cartilage is not so readily felt as the cricoid. But the latter is very close to the thyroid, especially in a child. You should make your incision start well up on the larynx, and it should be continued downwards for at least one and a half inches. Of course in a young child with a short neck, one and a half inches goes a long way, but it is very important to have a free division of the skin, or else you will not be able to get down to the trachea with ease and comfort. You can always put sutures in the skin afterwards. As you make your incision in the skin, the trachea should be steadied with the left hand,—in fact, you get down on the carotids and pick up the trachea, so as to render it prominent and steady. A practical point, and one which is not often spoken of in text-books, is, never rest your elbow on the chest of the patient; if you do, the violent efforts at respiration which the patient makes, shake your elbow, and the practice becomes one of great disadvantage. The incision is deepened through the subcutaneous tissue until the muscles are reached. These muscles are carefully separated from each other in the middle line. All bleeding points should be seized with pressure forceps. But you have to remember that the venous bleeding rapidly ceases when the trachea is opened. The bleeding is really due to the engorged state of the right side of the heart owing to the obstruction in the respiratory passages. Spencer-Wells forceps get rid of the bleeding of arteries quicker than pressure with the finger or with ligatures. Before getting to the trachea there is some deep cervical fascia across the upper part, and perhaps that layer gives more trouble than any of the other tissues. There are two things that may be done in a child. I think the best plan is to divide this fascia vertically, and to go right down through the isthmus of the thyroid gland. If you keep in the middle line there will be practically no hæmorrhage whatever from the isthmus of the gland. In an older patient, say between ten and sixteen years of age, I think it is perhaps better to divide the deep cervical fascia transversely, taking care that your knife does not slip off and wound the surrounding vessels. Then by means of one of the blunt hooks you can drag it downwards, and with it the isthmus of the thyroid gland. As soon as the rings of the trachea are clearly seen and definitely felt (two very important points), the scalpel should be plunged into the trachea in the middle line with the cutting edge directed towards the chin. Incise upwards through the first two rings of the trachea and through the middle of the cricoid cartilage in infants. That constitutes laryngo-tracheotomy, which might be more accurately termed "tracheo-laryngotomy." In an older patient the incision of the first two rings of the trachea is usually sufficient for the introduction of the tube. Now comes a practical point. The trachea being opened, the edges of the wound being held apart by the blunt hooks, there should be no energetic attempt made to get in a tube *directly* you have opened the trachea. In several cases I have not placed the tube in the trachea until half an hour after it has been opened. It is especially important in a case of diphtheria not to be in too much hurry to insert the tube. In such it is well, if possible, to get all the membrane which is within reach out of the trachea before introducing the tube. This can be done in a large number of cases by dissecting forceps, picking the membrane off. In other instances a feather may be moistened with bicarbonate of soda, and the membrane twisted on to it and then withdrawn. In others, again, it is suggested that the membrane should be sucked up. Before leaving tracheotomy I will give you these three points in connection with it :—Operate promptly, but studiously avoid hurry. Always keep in the middle line, unless the trachea happens to have been pushed on one side by a growth, such as a

thyroid tumour, then you have to make out the position of the trachea before you can cut down on to it. Lastly, see the whitish rings of the trachea, and definitely feel them before plunging the knife in. I am compelled for want of time to leave untouched the important question of the after-treatment of tracheotomy wounds.

The second surgical emergency I wish to speak of is hæmorrhage. Here, again, I cannot consider the treatment of hæmorrhage, but would speak of one of the means for overcoming excessive loss of blood. Of course bleeding requires prompt treatment. When a patient has lost a considerable amount of blood, as in hæmorrhage from so-called rupture of a varicose vein or *post-partum* bleeding, the chief factor in producing collapse is the diminished blood-pressure, owing to the unfilled state of the vessels. It is to overcome this that an injection of saline fluid is undertaken. Immediate or mediate transfusion were the means employed in the past. Either blood was taken from one person and introduced into the veins of another directly, or blood was taken from the giver into a bowl, then defibrinated and passed into the veins of the receiver. There are serious objections to both these methods. There is great liability of setting up clotting in the veins of the receiver, and the possible subsequent embolism is a very grave matter. Again, it was found that the corpuscles which are introduced from the giver into the receiver merely broke up in the blood of the receiver, but did not act in any beneficial way whatever. It is now recognised that what is wanted is fluid, and as long as that fluid does not seriously injure the blood of the receiver it does not very much matter what liquid it is. Therefore these plans of immediate and mediate transfusion have been almost entirely replaced by simply injecting saline solution into a vein of the person who is suffering from loss of blood. The details of the method are as follows :—To a bowl of warm water is added common table salt in the proportion of a teaspoonful to the pint. A more elaborate fluid is the following :—Chloride of sodium 50 grains, chloride of potassium 3 grains, sulphate of sodium 25 grains, carbonate of sodium 25 grains, phosphate of sodium 2 grains, dissolved in a pint of boiled water. One of the subcutaneous veins at the bend of the elbow, or, in certain cases, on dorsum of the foot, is chosen for the reception

of the fluid. The skin over the region selected should be rapidly cleansed as thoroughly as possible. The vein is exposed by an incision made over it, and then divided transversely. Into the open mouth of the vein is introduced a cannula, which may be made of glass, vulcanite, or metal. The glass cannula is perhaps the most simple, but the objection to that is that it is difficult to fix it into the vein. The vulcanite cannula has little grooves to enable it to be tied into the vein by an aseptic silk thread. But a cannula is not always available, and then you have to improvise some kind of tube. I know of one surgeon having used a tooth-pick. To the cannula is attached some two feet or more of rubber tubing, and at the end of that a funnel; a clip, with which you can control the flow, is placed upon the tube. If such apparatus be not obtainable, a clean Higginson's syringe may be used for the purpose of carrying out the injection, and such an appliance will generally be found in a house. The fluid should be at a temperature of 100° F., and should be introduced by hydrostatic pressure from a height of about eighteen inches. Great care must be taken to have the flow continuous and to keep out air-bubbles. In an adult it will be found that at least thirty ounces of fluid are required ; several pints have been injected successfully. But it must be remembered that this measure is of quite a temporary nature, its object being to increase the tension in the vessels, and so allow the heart to continue its action until the patient is able to form fresh blood to fill the vessels. It is this temporary character which is the cause of it so frequently failing. Still I have seen several cases where the procedure has been of considerable benefit. There is another way in which, supposing the necessary apparatus is not available, fluid may be introduced into the vessels, provided the heart is still beating and with fair strength, namely, by injecting about half a pint of fluid into the rectum. This is frequently rapidly absorbed into the vessels, and so increases the blood-pressure. Another method has been to introduce the fluid into the cellular tissue on the surface of the scapula.

The third surgical emergency is intestinal obstruction. This is a large subject, and obviously cannot be dealt with here, but in passing I should like to say that I am convinced that delay in treatment by operation is to be deprecated, and is

highly unsatisfactory. One of the commonest forms of intestinal obstruction is strangulated hernia, and I consider that herniotomy is preferable to taxis in the majority of cases, but I shall deal with this subject more fully on another occasion.

We now come to a very interesting surgical emergency, namely, retention of urine. In retention with definite symptoms of distension of the bladder, if one fails to reach the interior of the bladder by way of the urethra, what should be the line of treatment ? The bladder is only partially covered with peritoneum, namely, on the upper and posterior part. There are three means of entering the bladder without the peritoneum being touched—(1) through the urethra, (2) immediately above the symphysis pubis, and (3) through the rectum below the reflection of peritoneum. Puncture of the bladder through the rectum is much less commonly practised than it used to be. The objections are—first, that it is difficult to do ; secondly, there is a liability of getting septic material into the bladder from the rectum ; and thirdly, there is the danger of working in the dark and wounding the peritoneum. Generally speaking, the bladder is reached above the symphysis pubis, and the more the bladder is distended the higher the reflection of peritoneum will be raised. It is of importance that you should be quite certain you have to deal with a distended bladder. Its presence may be determined by dulness, by feeling a pyriform or globular swelling, by fluctuation, and by the knowledge that the patient has not passed water for some length of time, although he has been in the habit of passing it satisfactorily beforehand. Therefore the best treatment is supra-pubic aspiration, it is performed as follows.

The instruments necessary are a razor or a scalpel, and an aspirator with a very fine trocar and cannula. Shave and wash the region of the pubes, that area being particularly liable to be very septic. Make a small incision through the skin in the middle line just above the symphysis pubis. Then, using a very fine trocar and cannula attached to the aspirator bottle, a puncture should be made downwards and backwards practically towards the tip of the coccyx. Obviously it would be dangerous to go upwards and backwards. The trocar and cannula should not pass in beyond two and a half inches to commence with. The amount

of rarefaction in the bottle should be slight. Repeated aspiration does very little harm, provided you use a small trocar and cannula. But most frequently if you aspirate once and the patient is relieved of the distress, you can generally get into the bladder through the urethra very shortly afterwards. I show you the apparatus used. An incision is first made so as not to blunt the trocar, and there is then no leakage from the bladder, because the tissues close in on the wound.

Cerebral compression is our next subject. One may give as the causes of this, depressed fracture, extra-dural hæmorrhage, the presence of pus, especially in cases of otitis media, either extra-dural or intra-cerebral. It is imperative in all these cases to operate without any delay. In the majority the operation consists of trephining and removing the cause of the compression. The operation is more elaborate than those I have mentioned in connection with the other surgical emergencies, and therefore I shall not have time to deal with it. It is an emergency in which prompt operation may make all the difference between life and death.

In addition to the foregoing, there are some conditions with which we are not infrequently confronted, and which require immediate operative manipulation, either with a view to diagnosis or treatment.

If the patient has all the symptoms and many of the signs of pus in the pleural cavity, the line of procedure I think it well to adopt is as follows :—Firstly explore with a small exploring syringe, after rendering the surface clean and the syringe aseptic. A useful syringe is the hypodermic syringe with a fairly large needle. The length of the needle is important; an ordinary needle attached to a hypodermic syringe is not long enough. It may be necessary to make several punctures in such cases before reaching the fluid, but the first puncture should be over the area of greatest dulness. If pus be found, no delay should be allowed before it is thoroughly evacuated. Sometimes in children simple paracentesis may be followed by a good result in the way of no further collection of pus occurring. But more often it is not so, and therefore in most cases, especially in adults, an incision into the thoracic cavity is necessary. I cannot enter fully into this, but the following practical points may be

of use.   Anæsthetise with chloroform with the patient in the dorsal position.   If possible, avoid moving the patient about while he is under the influence of the anæsthetic, and particularly be careful to abstain from turning him over on to the sound side.   The reason for this precaution is that if he has one side full of fluid, the heart is very likely to be displaced, and the other lung is working at a great disadvantage.   The weight of the fluid would now press on the lung of the sound side, and may so seriously interfere with its action that the patient dies immediately.   Thoroughly cleanse the skin over the region in which you are going to operate, which area is generally septic from the application of poultices and the like.   If the pleural cavity contains much fluid, select the seventh intercostal space just anterior to the line of the posterior fold of the axilla.   Make your incision along the upper border of the rib below in this space, and see that the incision is made directly into the pleural cavity, and is in no way valvular.   If the arm is drawn too much upwards, the skin is liable to be dragged up, and the result is that your skin incision is at a different level from that in the deeper tissues.   Let the fluid escape slowly ; a rapid outflow is dangerous.   Do *not* wash out the pleural cavity, even if the pus which you obtain is very fœtid ; it is dangerous to wash out the cavity at the first incision into the thorax.   Two or three days afterwards, if the patient becomes considerably improved, you may gently wash out with safety.   Irrigation causes irritation, and that and the coughing produced cause the case often to end fatally.   Use a large drainage-tube — that is to say, at least of the diameter of your finger, and do not have it longer than two or three inches ; six or seven inches of tube in the pleural cavity is worse than useless. You must see that your tube is securely fixed and prevented from slipping into the cavity.   One of the best means of keeping the tube in position is by putting a stitch partly through the tube and through the skin at the edge of the wound.   Or you may use an empyema tube with a large shield, which will prevent the tube from slipping into the thoracic cavity.   In some cases the excision of some portion of a rib or ribs may be necessary, so as to get a free opening into the thorax ; in other cases a counter-opening may have to be made at a ·e dependent part.

Lastly, I come to another small but important operation, which is often lost sight of nowadays, and is not practised nearly so frequently as in the early part of this century—venesection.   This procedure is undoubtedly useful in cases of great engorgement of the right side of the heart, as in some cases of mitral disease.   I have also found it useful in pneumothorax suddenly developed, where there is also laboured action from over-loading of the right side of the heart.   I may instance a case of fractured ribs with pneumothorax, or of a phthisical cavity suddenly bursting and air passing into the pleural cavity.   Venesection is performed by opening the median basilic vein at the bend of the elbow.   The skin is cleansed and the arm constricted by a bandage about its middle, at about the level of the insertion of the deltoid, so as to make the veins more prominent below.   An incision is then made over the vein, its walls being only *partially* divided in a transverse direction.   Such a wound in the vessel tends to gape, and the result is that hæmorrhage occurs more freely.   A wound made longitudinally does not tend to gape, and if the vein be cut completely across, it collapses and the bleeding ceases.   In these cases of venesection the difficulty is to get sufficient blood out of the vein, not to check the flow.   You will find that generally about fifteen ounces must be withdrawn to do much good, the patient becoming faint when sufficient has been taken, and you may find that the symptoms for which you are doing it are considerably relieved.   After you have got as much blood as you want, the vein should be completely severed, so as to allow the ends to retract.   Then a pad of antiseptic gauze should be fastened over the wound, when union will usually take place without suppuration.   In opening the median basilic vein you have to be careful to avoid two things.   First, do not go through the deep fascia and wound the artery below.   This can only be done by carelessness.   Secondly, do not cut through any of the branches of the internal cutaneous nerve which lie in front of the vein.   If you divide any of these there may be severe neuralgia about the site of the scar afterwards.   This pain not infrequently followed venesection in the old days.

ON THE TREATMENT OF UTERINE MYOMATA (FIBROIDS).

BY

J. BLAND SUTTON.

LECTURE VI.—THE IMMEDIATE AND REMOTE RISKS OF SUPRA-VAGINAL HYSTERECTOMY.

THE removal of a myomatous uterus through an incision in the belly wall is beset with the same dangers that attend abdominal operations in general. Of these the chief are shock, hæmorrhage, injury to viscera, sepsis, thrombosis, and embolism; nevertheless some of them depend on peculiarities of the operation, and demand careful considera- tion. It will be convenient to consider them in detail.

Shock.—The amount of physical disturbance clinically termed " shock " which follows any grave abdominal operation is often well marked after supra-vaginal hysterectomy, especially when the tumour has burrowed deeply into one or both mesometria, even when the loss of blood has been small in amount. Unless shock has been intensi- fied by great loss of blood during the operation it usually disappears in six or twelve hours. The degree of shock may be gauged by the fall of the bodily temperature and the duration of the de- pression. It is no uncommon thing for the temperature to fall to 96° Fahr. after a severe operation, and then in a few hours it will rise to 99° or 100°. This causes no alarm, but post- operative shock with the temperature at 96°, or lower, which does not rise in twelve hours needs consideration, and it is wise to resort to restoratives such as injections of warm water, beef-tea, or milk, by the rectum, with a small quantity of brandy added. The deepest shock in these opera- tions usually accompanies unusual loss of blood.

Hæmorrhage.—Bleeding may ensue with the reaction, and may arise from the slipping of an ill-applied ligature from some small vessel which was unnoticed during the operation, but which bled freely with the reaction. When the bleeding is very severe its signs are generally unmistakable. The patient should be re-anæsthetised, the wound opened up, and the vessel secured; the clot is re- moved by irrigation or sponging. Whilst the wound

is being sutured the patient should be transfused with two or three pints of saline solution, according to the necessity of the case (see Lecture V).

The Bladder and Ureters.—Considering the intimate relations which the bladder and vesical sections of the ureters bear to the neck of the uterus, it is clearly very necessary to be watchful and cautious in order to avoid damaging them in the performance of hysterectomy. Ofttimes, in spite of every care, it happens in cases where the bladder and ureters have not been obviously in- jured, their function is often greatly disturbed after hysterectomy, and this disturbance is occasionally a source of great distress.

The bladder.—This has been cut and its cavity opened in making the primary incision, and there is especial liability to this accident when the urethra is compressed against the pubes, and the bladder displaced above its normal level by a cervix-myoma.

Accidents of this kind are best avoided by introducing a sound into the bladder in order to ascertain its limits at the outset of the operation, and leaving it in the bladder to act as a pilot during the subsequent stages. Inadvertent inci- sions into the bladder should at once be closed with continuous sutures of fine silk, and the bladder tested by filling its cavity with sterilised milk to be sure that there is no leakage.

Occasionally, and especially with cervix-myo- mata, the tumour may burrow between the uterus and the bladder; it is then necessary in separating them to exercise very great care. On one occasion I found the bladder spread over and adherent to the fundus of a myomatous uterus, obliterating the utero-vesical pouch.

In cases where it is necessary to cut the cervix at or below its middle, the bladder will come so prominently into the field of operation, and be so closely associated with the anterior peritoneal flap, that it runs the risk of being pricked by the needle, and even stitched to the cervical stump when the peritoneal flaps are sutured.

The ureter.—These ducts seem to be more often injured than the bladder. In writings dealing with the operative details of hysterectomy it is customary to describe minutely the relations of at least the pelvic portions of the ureters. In all varieties of abdominal and pelvic operations there is needed, besides a knowledge of regional anatomy, the

power of "appreciating the nature of tissues." This in plain words means "knowing a thing when one sees it." For example, in removing a large myoma which has burrowed deeply in the mesometrium it may push the ureter out of its course, until it lies like a strap around the periphery of the tumour, or it may lie on the crown of the myoma, and be carried up to the level of the brim of the true pelvis. Regional anatomy in such circumstances is of little avail; all depends on the immediate recognition of the nature of the displaced tissue. To divide a ureter even though the accident be immediately recognised, and the surgeon is able to repair it, is an event that always adds to the anxiety necessarily associated with an operation which in itself jeopardises life. When one or both ureters are divided, and the accident is un-recognised, then the chances of recovery are greatly diminished; and even when the patient survives she is in an extremely miserable condition.

In addition to actual division of a ureter, either by cutting instruments or tearing during the enu-cleation of a tumour from the pelvis, it is apt to be included in a ligature. When one ureter is thus occluded the accident is scarcely suspected until a few days after the operation; then the ligature separates, and urine begins to leak into the belly or trickles from the vagina. When this happens the operator may be a little perplexed as to whether he has to deal with an injury to the bladder or a ureter, but a little watchfulness soon solves the problem. When the leakage is due to a vesical fistula the whole of the urine escapes through the vagina, but when the leakage is due to a ureteral fistula half the total quantity escapes by the vagina (or in some still more unfortunate cases through a sinus in the abdominal wall), whilst the other half is voided in a regular manner by the bladder. In order to place the matter beyond doubt, it is necessary to put the patient in the lithotomy position, and expose the vagina by a duck-bill speculum in a good light, and inject a measured quantity of sterilised milk into the bladder; if this viscus be intact the milk will be retained, but if it be fistulous the milk will escape into the vagina. A systematic examination of this kind is of great advantage, inasmuch as it may enable the surgeon to determine which ureter has been injured; and as a ureteral fistula often demands the removal of kidney for its cure, it is of the utmost import-

ance to decide which ureter is at fault, as irreparable harm would be inflicted upon a patient by excising the kidney belonging to the intact ureter.

As far as my inquiries have extended I have failed to find an instance of the ureters being injured in the supra-vaginal operation; it is the complete removal of the neck of the uterus, either in vaginal hysterectomy or pan-hysterectomy, which so greatly endangers these ducts.

There is a form of vesical disturbance which arises after hysterectomy which demands full con-sideration. In all cases it would be judicious to have the bladder emptied every six hours by catheter, but even in the hands of the most trust-worthy nurses the urine will occasionally be con-taminated and decompose. To avoid this my nurses are instructed to let the patient void urine un-aided if possible, and pass the catheter perhaps once in forty-eight hours to be quite sure the bladder empties itself. In many instances the patient will for three or four days after the operation void urine unaided; she then gets retention, and re-quires the routine use of the catheter three times daily for ten or fifteen days. This form of incon-venience is prone to arise after the removal of a cervix-myoma. It is fair to assume that when the bladder has been freely separated from the neck of the uterus, even with the utmost care and gentleness, bruising and even more serious damage is inflicted on the muscular tissue of, and the nerves distributed to the bladder, thus causing temporary paralysis with the retention of urine as a consequence. Such conditions necessitate the use of the catheter from the beginning. The later form of disturbance arises from a different cause. When the operator has carefully sutured the peri-toneum over the stump of cervix he will be able to assure himself by means of the sound that in a large proportion of cases the posterior surface of the bladder lies in direct contact with what is left of the uterine cervix, no peritoneum intervening. Such a bladder may contract efficiently for two or three days after operation; then become atonic and dilate, retention being the consequence. This behaviour is due, I believe, to inflammatory exudation into the perivesical connective tissue; occasionally this exudation will extend beyond the pelvic connective tissue, and involve the sub-serous tract belonging to the anterior abdominal wall. When pyosis (suppuration) supervenes the

vesical incapability continues until the pus finds an outlet, a common situation being the lower angle of the abdominal incision. As soon as the pus escapes, the bladder regains its power. So far the difficulties which have been considered are those due to paralysis of the bladder, but occasionally vesical irritability is observed. This in many instances is due to cystitis, the result of decomposition of urine, the outcome of catheterism, but it is often due to other causes. For instance, a septic ligature gives rise to an abscess; the pus and sometimes the ligature make a way through the bladder wall, the ligature with its knot forming a nucleus for phosphatic deposit.

On one occasion a patient who had been submitted to supra-vaginal hysterectomy in the Antipodes suffered from frequent micturition on the voyage home. Her urine was foetid, purulent, and often contained calculous material. On dilating the urethra I found that the supra-vaginal portion of the cervical stump had made its way through the posterior wall of the bladder, and was projecting freely into the vesical cavity, bristling with thick silk ligatures, arborescent with phosphatic deposit. The ligatures were removed, the urine soon became acid, and in spite of the anomalous body in the bladder the patient soon ceased to experience any inconvenience.

It has long been known that silk ligatures employed in ovariotomy, oöphorectomy, and hysterectomy, as well as sutures employed in operations on the bladder, are occasionally met with in the centre of soft phosphatic vesical calculi. There is an unusual form of bladder disturbance secondary to ureteral spasm which it is necessary to draw attention to.

The ureter is practically a muscle traversed by a channel lined with epithelium. At its lower end the muscle-tissue of the ureter is directly continuous with that of the bladder. It has been determined by actual observation that rhythmical waves of peristaltic contraction occur in the ureter, the waves passing invariably from the kidney to the bladder. These contractions arise in the same way as those of the heart, and may be spoken of as the " beats " of the ureter, and they are subordinated to the flow of urine into the renal pelvis : the more active the secretion of urine, the more frequent and vigorous are the beats of the pelvis and ureter.

I have satisfied myself in two or three cases where great vesical irritability became an annoying symptom after pelvic operations, and in which there was no cystitis, that the spasmodic contractions of the bladder did not arise in its own walls, but were due to exaggerated ureteric beats, which instead of ending at the bladder, spread to and induced rhythmical contractions of the vesical muscle; the spasms of the ureter and bladder being due to the fact that the ureter was entangled and partially occluded by inflammatory exudation in the base of the mesometrium. In one case the suffering was so great that I excised the kidney connected with the implicated ureter, a proceeding which gave immediate and permanent relief. The accidents and inconveniences to which the bladder and ureters are liable may be briefly summed up thus :

1. The *bladder* may be cut in making the primary incision.
2. It may be torn in separating it from the supra-vaginal cervix or in detaching adhesions.
3. It may be punctured in suturing the peritoneal coverings of the stump.
4. The bladder wall may be perforated by an abscess, a ligature, or the supra-vaginal portion of the cervical stump.
1. The *ureters* are liable to be cut or torn.
2. One or both may be included in a ligature, or,
3. Worried by being involved in inflammatory exudation in the pelvis.

The ureter and bladder complications have been considered at length because they are perhaps the most serious risks which beset hysterectomy, whether vaginal or abdominal.

Injury to Intestines.—These are far less common in operations on the uterus than in complicated ovariotomy. Should the bowel be injured, the opening should be at once occluded by careful suturing with thin silk.

The stumps and ligatures.—After an uncomplicated supra vaginal hysterectomy there are at least three stumps,—a median one consisting of the remnant of the uterine cervix, and two lateral stumps consisting of a portion of each mesometrium, with the ovarian vessels and nerves and the round ligament. When the appendages are not removed the Fallopian tube and ovarian ligament

are necessarily included in the ligature. On those occasions when it is desirable to ligature the round ligament on one or both sides separately, then the lateral stumps are increased to three or four according to circumstances.

Of course the formation of so many separate stumps increases the risk, for every piece of silk employed in securing these structures is an additional element of danger, however carefully the silk be prepared.

The cervical stump needs very careful consideration. The amount of the neck of the uterus left behind varies according to the size and position of the tumour ; sometimes the whole cervix is left, at other times the supra-vaginal portion is completely removed, and occasionally, especially in the case of a large subserous myoma sessile on the fundus of the uterus, it may happen that a fair proportion of the body of the uterus forms part of the stump. The character of the uterine stump often exercises a very significant influence on the convalescence. A narrow cervix with an undilated canal furnishes an ideal stump. A thick cervix, whether long or short, and especially when it contains an unhealthy endometrium, constitutes an unsatisfactory stump, and is very apt to initiate trouble. The expanded cup-like cervix left after the removal of a large intra-cervical myoma gives, as a rule, excellent results.

Many operators regard the cervical canal as an element of danger, inasmuch as it furnishes a route for the conveyance of infective agents from the vagina to the peritoneum, some of which may be, as it were, in ambuscade in the cervical endometrium. The opinion that the cervical canal is in itself an element of danger I do not share ; on the contrary, I believe it serves as an excellent drainage track and makes supra-vaginal hysterectomy a possible operation. On critically studying the clinical records of women submitted to this procedure, one of the most striking features in the charts is the almost constant rise of temperature for a few days following the operation, the elevation standing in close relation to the thickness of the cervical stump and the diameter of its canal. With a narrow stump, as a rule, the temperature reaches 100° F., and gradually subsides to normal in three or four days. With a thick cervical stump the temperature sometimes ascends to 102° or even 103°, and may take seven, eight, or even ten days

to subside. Coincident with a marked subsidence of temperature there is an escape of thin blood-stained fluid from the vagina. When the cervical stump is narrow it is possible to obtain a more perfect hæmostasis than with one that is thick and indurated. Even when there is no escape of blood after the operation some serum is sure to ooze from the cut surfaces, and this will leak into the pelvis until the peritoneal flaps adhere ; then it will have but one avenue of escape, namely, the cervical canal. Failing this, the exudation will burrow under the peritoneal flaps and infiltrate the perivesical tissue, and occasionally pyosis (suppuration) with all its inconveniences and dangers is the consequence. That the cervical canal affords an excellent drainage track is, I think, indisputable ; that it is an occasional source of danger is also undeniable. In some of my early hysterectomies I tried the effect of routine drainage by inserting a narrow india-rubber tube (I discarded glass drain-tubes in 1892) behind the stump. It was a striking fact that even in those cases where the hæmostasis seemed most perfect blood-stained serum amounting to three ounces would escape along the tube within the first twelve hours of the operation. I soon satisfied myself that the peritoneum could easily and safely deal with this, and I came to the conclusion that the employment of a drain-tube probably adds to the risks of the operation.

Sepsis.—It is easy to conceive that if the endometrium be septic at the time of the operation the pelvic peritoneum could be infected from this channel, especially in those cases where the uterus contained a gangrenous submucous myoma at the time of the operation. A few cases of fatal peritonitis following supra-vaginal hysterectomy have been reported in which infection has been attributed to the cervical canal.

Thrombosis.—In operations involving the application of a mass-ligature to venous plexuses it occasionally happens that the resulting coagulation in the veins extends sometimes to neighbouring venous trunks. Thus thrombosis of the venous plexuses in the broad ligament may extend to the iliac veins and lead to œdema of the lower limb after ovariotomy, oöphorectomy, and hysterectomy.

Embolism.—In perusing the clinical histories of a long series of cases of ovariotomy, or of hysterectomy, here and there a record may be read to

this effect :—" The patient did well after the operation till the eighth day ; the sutures were taken out and the patient sat up, laughed and chatted with the nurse, then suddenly fell back dead." Anything more awfully tragic than this it is difficult to conceive, and, as a rule, after such a sad occurrence the relatives of the patient are so upset that they very rarely permit an examination of the body.

Death in such circumstances is attributed to embolism of the pulmonary artery. This in many cases is pure assumption, for there are excessively few records in which the presence of the embolism has been demonstrated.

Sudden death seems to be a more frequent sequel to abdominal hysterectomy than to ovariotomy. It is well to bear in mind that a patient may after hysterectomy exhibit the signs of pulmonary embolism and recover, and curiously enough a patient may have signs suggesting a succession of emboli.

Pyuria.—When a myoma has been impacted in the pelvis and seriously interfered with the bladder it may have wrought indirectly serious injury to the kidneys, such as dilatation of the renal pelves and septic pyelitis. Removal of the myoma relieves the pressure, but the renal damage is irreparable. I have satisfied myself that some patients who had slight pyuria before the operation presented this symptom a year afterwards.

Nerve disturbances. Supra-vaginal hysterectomy, like other grave surgical operations, is liable to be followed by mental disturbance ; but as far as I can ascertain they are not so serious or so persistent as those which occasionally follow amputation of a limb, or childbirth.

The nerve disturbances which trouble patients most are those which supervene on complete removal of both ovaries, and these are the well-known flushes which are so indicative of an accentuated menopause. In the majority of cases they rapidly diminish in frequency, and in a few months cease to cause inconvenience. These are avoided by conservative hysterectomy even when only one ovary is left.

Exceptionally, in removing a large myoma sessile on the fundus, a portion of the body of the uterus may be left ; under such conditions, when one or both ovaries are also left and the patient is still in the menstrual period of life, menstruation will continue regularly.

It is clearly established that a wombless woman can enter into all the pleasures of life and enjoy them as well as those who have not had the misfortune to develop large tumours in the pelvis. It is, moreover, a cowardly act to tell women who require hysterectomy that the operation will increase their liability to insanity, cause them to lose their voices, and that they will become sexless. Such statements cause unnecessary alarm, and inflict upon them much anguish of mind, which it is our plain duty to spare them ; moreover, as these statements do not accord with facts, they are untrue.

On the Treatment of Epilepsy.—Dr. Paul Flechsig ('Neurol. Centralblatt,' No. 2, 1897) states that, by his bromide-opium method of treatment, in a series of fifty cases he has had six excellent results, with cessation of attacks for two and one four years. All the patients presented the following :—(1) long duration of the disease, some even twenty years ; (2) other treatment, and particularly by bromides, has been without avail ; (3) all kinds of psychical phenomena were present, such as weak memory, lack of nerve tone, irritability, morbid fear ; (4) a "torpid" constitution, generally with anæmia. As a rule, he does not begin with the combined opium and bromides treatment, except in those cases in which the disease has apparently developed through fear, sorrow, &c. ; but starts with the ordinary bromide treatment. He uses the opium when bromides do not affect the disease, when bromidism begins, &c. The reasons for the good results of this treatment are as yet not positively known. The writer regards diet, rest in bed, rectal enemata, &c., as important accessories to the treatment. It may be that the opium produces its good effects in overcoming the nervous irritability and the causeless fear of these patients, for most epileptics are psychically perturbed. The patients must be treated as if quite ill, *i.e.* they must be under the continued observation of the physician and of a reliable nurse.

Medical Record, February 26th, 1898.

TINCTURE of aloes, diluted one half, or even more, by water, is said to be an effective injection in gonorrhœa after the acute symptoms have subsided.

Med. Summary.

CLINICAL LECTURE

ON

SOME DISEASES OF THE LARYNX.

BY

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GENTLEMEN,—As some of you are aware, I have attending my clinics at the present time some five or six interesting cases of laryngeal disease, and I thought it might be useful to you if I brought them together, so that we can study their characteristics and discuss the lines which guide us in their treatment.

Let me just remind you that on examining a larynx you should also take note of surrounding structures, e.g. the epiglottis, base of the tongue, the arytæno-epiglottic folds, and the upper end of the œsophagus ; in the larynx itself note the colour of the cords and their mobility on phonation, and whether their mobility is equal on both sides, the ventricular bands and the ventricles of Morgagni (if possible) ; pay attention also to the condition (anæmic or congested) of the laryngeal mucous membranes. Finally, when the patient takes a deep breath, look into the trachea, and especially note any appearances to be seen in its upper regions. Occasionally it is quite easy to see the bifurcation of the trachea into the two bronchi.

By a careful examination of the larynx and its surroundings you can sometimes gain valuable information. Let me give you an illustration. A few months ago I was asked to examine a patient who had coughed up a quantity of blood, and who was suffering from slight stridor, and whose right vocal cord was paralysed—"recurrent paralysis ;" no physical signs were present in the chest, but a small aneurysm had been diagnosed to account for the symptoms. I found, on looking beyond the right vocal cord into the trachea, a whitish nodule about the size of a filbert nut situated about 3½ inches below the glottis on the right side of the trachea, and projecting into its interior.

I diagnosed a "malignant growth ulcerating into the trachea," and producing the stridor, hæmorrhage, and paralysis. In three days' time a postmortem confirmed the diagnosis, and revealed a primary epithelioma at the lower end of the œsophagus, with secondary infection of the lymphatic glands, one of which I had seen ulcerating into the trachea. The patient had never had a symptom of the primary growth.

Tubercular Ulceration of the Epiglottis.

The first case I show you is the young man, æt. 33, who was brought me by his medical attendant, Dr. Blake. He complained of irritation in the throat causing cough and occasional tingeing of the expectoration with blood. He also suffered from a profuse post-nasal catarrh. You will see that the tip of the epiglottis is red and swollen, and presents a sort of "nibbled" appearance, the cartilage being exposed in two places. It is not very painful. There is no swelling of the arytæno-epiglottic folds, and the larynx is quite normal. The lungs show well-marked signs of phthisis in both apices. The points of interest are—(1) The unusual seat for the commencement of tubercular disease—generally the mucous membrane of the arytænoid region first becomes infiltrated. (2) Hoarseness is a common early symptom, but is absent here because the larynx is unaffected. (3) As a rule the surrounding parts are anæmic (especially in women), but here they are distinctly congested. The local treatment in the case will be to curette the tip of the epiglottis and rub in a solution of lactic acid, using a 60 per cent. solution to commence with. I need scarcely say attention will be paid to his general health as far as possible during the time we are treating the local manifestation. If such a patient as this could spend a few months in the dry air of the Engadine or Davos, or take a sailing voyage and have the treatment we suggest efficiently carried out, it is almost certain he would get well, as the lung trouble is in an early stage.

Tubercular Disease of Larynx.

This man, æt. 30, has had throat trouble for six months. Hoarseness was the first symptom, followed in two months' time by pain on swallowing (dysphagia). He has a bad cough, and is losing flesh.

When examining the larynx notice the red and swollen epiglottis, the pear-shaped œdematous mucous membrane covering the arytænoids, and the right false vocal cord is red and swollen, and

covered with a large, grey, superficial ulceration. The true cords are red and swollen, and also ulcerated. Advanced tubercular mischief is very obvious in both lungs. I would advise you to look well at the larynx and carry away the picture of it in your mind, because it presents the features of tubercular laryngitis as so often seen. Our treatment here must, I fear, be almost limited to the relief of pain, and fortunately we can do a good deal for him in this respect. He has already obtained considerable relief from the frequent use of Chappell's spray, which is a combination of Guaiacol, Ol. Ricini, Ol. Gaultheriæ, Ol. Hydrocarbonis, and Menthol. In using any of these sprays the larynx should first be sprayed out with a warm alkaline solution, so as to get a clean surface free from mucus for your remedy to act on.

If this treatment loses its efficiency I shall try submucous injections of guaiacol, which are said to greatly relieve the pain and swelling in these cases. A special instrument is necessary, and one drop of the solution should be injected into the swollen mucous membrane of the arytænoids every other day. The instrument (Donelan's) is made by Allen and Hanburys.

Should this fail, we have left curettement of the larynx. This operation has been extolled by Heryng and Krause, and I have seen some excellent results in which the relief of pain has been enormous. By means of an intra-laryngeal curette unhealthy tubercular ulcers can be scraped, and then lactic acid applied to their surfaces, or by means of a pair of these intra-laryngeal forceps (Krause's) portions of unhealthy or œdematous tissue can be easily removed. The parts are of course thoroughly cocained first of all, and the pain which follows the operation is much relieved by sucking small pellets of ice.

I do not think you should adopt this latter treatment except under two conditions.

1. When the lung mischief is slight and not very active, and where operative treatment of the larynx may hold out some prospect of cure.

2. In advanced cases where the pain is very great, and the patient is slowly starving, rather than suffer the pain which accompanies the swallowing of even liquid food. In such cases the removal of portions of the swollen tissues is often followed by great relief.

I can see no good in worrying patients with active treatment when the lung mischief is advanced and the throat is not a source of great discomfort, although it may be extensively diseased.

Epithelioma of Left Vocal Cord.

The next case is the spare man, æt. 49, who came here a fortnight ago complaining of one symptom only—hoarseness of two months' duration. You remember that on examining the larynx I saw a small whitish thickening occupying the anterior fourth of the left vocal cord; the latter was only slightly movable on phonation, and its posterior part was congested. The right cord was normal in all respects. The appearance of the thickening, the immobility of the cord, and the hoarseness rendered the diagnosis of malignant disease almost a certainty.

On February 21st, Mr. Bailey having anæsthetised the patient, I removed the left vocal cord by the so-called operation of thyrotomy, more properly termed thyro-chondrotomy. You will remember that I first did a tracheotomy, then inserted a Hahn's sponge cannula, and whilst the sponge was swelling to occlude the trachea, I incised the skin over the thyroid cartilage and divided the latter structure exactly in the middle line.

The insertion of the Hahn's tube is to prevent the blood running down into the lungs when you are removing the growth. It usually takes eight to ten minutes to occlude the trachea, and when this time had elapsed the house surgeon held open the halves of the thyroid cartilages with blunt hooks, and the growth, which was at once visible, was included in an oval incision, the hinder end of which was at the posterior end of the affected cord. The whole of the latter, with a considerable part of the false vocal cord, was then removed down to the thyroid cartilage, which was left quite bare. One small branch of the superior laryngeal artery required twisting, otherwise there was very little hæmorrhage. I then painted the intra-laryngeal wound with Whitehead's varnish, an antiseptic and styptic, and drew the two halves of the thyroid cartilage together with a catgut stitch, removed the Hahn's tube, and stitched up the whole external wound with the exception of one inch at the lower end. The patient has done remarkably well, and the stitches were removed on the fourth day. The first day he had nutrient enemata, the second milk and beef tea by mouth, and the third

day a boiled sole. His temperature never rose over 101° F.

Mr. Waggett has cut some beautiful sections of the growth, which fully reveal its malignant nature, and he tells me that the marked karyokinetic changes seen in the nuclei of the cells indicate the rapidly growing nature of the tumour.

The case is an important one, as illustrating how an apparently trivial symptom (hoarseness) may be the only sign of such a serious disease, and therefore it should teach us the importance of always examining the larynx of a middle-aged person who has suffered from hoarseness of two or three weeks' duration.

The fixation of the cord, and the whitish, warty-like thickening are very suggestive of malignant disease, but occasionally tubercular disease gives a very similar appearance, as in a case I recently showed at the London Laryngological Society, where nearly all agreed that it was malignant, but a post-mortem examination showed both tubercular meningitis, and laryngitis and the fixation of the cord was due to disease of the crico-arytænoid joint.

I would just add that the results of early operation in such cases as the above are exceedingly good; many cases are on record in which there has been no recurrence for years afterwards. Everything depends on getting the case early, before the disease has extended outside the larynx. I performed a similar operation to this on a patient two years ago; he is still in perfect health, and has increased in weight by fifteen pounds.

? Mechanical Fixation of Cords.

Here, gentlemen, we have a conundrum, the solution of which I cannot give you. Patient's age is 44. He came here in 1896, complaining of hoarseness of three weeks' duration, and pain on swallowing. There was slight stridor, which, however, rapidly increased in the course of a few days. The mucous membrane over the arytænoids was so swollen as to almost obscure the cords, but on the right cord could be seen a large apple-jelly-like granulation. There was no history nor signs of syphilis or tubercle, neither could any one at the Chest Hospital find evidence of aneurysm or growths in his chest. The urine was normal. I put him on increasing doses of iodide of potash in combination with mercury, but with no result.

His stridor increased, and to such a degree that eventually I was obliged to do a tracheotomy without an anæsthetic. His general condition at once improved, but he has been obliged to wear a tube ever since. He speaks fairly well, and can expire freely, but on inspiration his cords flap together, and he has to make use of his tube. He has no difficulty in swallowing. His knee-jerks and pupils are normal. It seems to me that it is quite possible that the cords are fixed mechanically, i.e. due to disease of the crico-arytænoid joints—a suggestion which is to some extent borne out by the acute onset, the swelling over the arytænoids, and the pain on swallowing. Such a bilateral condition is exceedingly rare, but the explanation seems to me as satisfactory as any other.

Double Recurrent Paralysis.

This man is 49 years old. He came to the hospital six years ago suffering from difficulty in breathing, and was in high dudgeon because he had been "wet-towelled" as a malingerer at another hospital, and also had the faradic battery applied to him. His stridor became so bad in the course of a day or two that I had to perform tracheotomy, and he has worn his tube ever since.

The cords are just like those in the last case, normal in appearance but adducted; and whilst expiration is easy, inspiration is impossible. We can find no cause for the paralysis. You notice he is in perfect health; no physical signs can be found in his chest, neither has he any symptoms of tabes.

We know that a paralysis of this kind may be the first and only symptom of the last-mentioned disease, but it has been so long the only symptom that I am beginning to think we must invoke other explanations; and it seems possible that such a condition might be due to a peripheral neuritis, such as is found in other situations. He drinks hard, but has no other sign of alcoholic neuritis, neither are there any evidences of syphilis, gout, or lead poisoning. So that we must remain ignorant of the cause of his paralysis, or hold our souls in patience for a time.

Pachydermia Laryngis.

This, my last case, is a woman who came to us for hoarseness. We found a large thickening of mucous membrane on the anterior aspect of

arytænoid commissure, which prevented apposition of the cords on phonation, and hence the hoarseness. As a rule the disease affects the cords, a nodule on one cord which fits into a depression on the opposite cord, and so produces a sort of ball-and-socket arrangement. The nodule is a chronic inflammatory growth. Absolute rest is a most important factor in treatment of the latter condition. In this case I cauterised the growth with the galvano-cautery two or three times, and with some relief, but in order to save time I am now removing it piecemeal by means of these forceps recently invented by Dr. Whistler.

We often notice a tubercular infiltration in this position, but it is more of the nature of a granulation, while this is tough and resisting.

Slighter degrees of the same condition are commonly seen in cases of long-standing chronic laryngitis, and are especially frequent in male alcoholics

I am sure such cases as these, gentlemen, will impress you with the great and growing importance of careful laryngoscopic examination ; the diseases are more often present than looked for, and I may say that all these cases are at present attending here. Finally, such investigations will not rarely help you in making a diagnosis of what may otherwise seem an obscure case.

Hysterical v. True Peritonitis. By Dr. Hopkins ('Col. Med. Journ.').—There is given in this article a very good comparison between hysterical simulated peritonitis and true peritonitis. Simulation of acute diffused peritonitis by the hysteric is of rare occurrence, but in neuropathic women the localised inflammatory affections are sometimes very closely counterfeited. In hysterical peritonitis the pain usually predominates in the left side of the body. It often develops and ceases, like other hysterical symptoms, under the influence of moral impressions. In hysterical peritonitis a slight touch of the skin produces more distress than deep pressure, although in neuropathic patients deep pressure in the hypochondriac region causes intense suffering. In hysterical peritonitis there is often vomiting, but never nausea. The vomiting does not become fæcal. The pulse and temperature in counterfeit peritonitis are usually about normal.

The Post-Graduate, February, 1898.

TREATMENT BY EXCISION OF BURSAL CYSTS IN CONNECTION WITH THE KNEE-JOINT.

BY

A. MARMADUKE SHEILD, M.B., F.R.C.S.

IN general terms it may be stated that bursal formations about the knee are met with in the following situations : (1) Over the lower part of the front of the patella and its ligament ; (2) beneath the ligamentum patellæ ; (3) on the inner aspect of the tibia in connection with the insertions of the hamstring tendons ; (4) beneath the quadriceps extensor muscle. Of this group, though often enlarged as in the common " housemaid's knee," I do not propose to write. It is in the ham towards the inner or outer aspect that these formations give the greatest trouble in treatment, though as a rule their diagnosis is tolerably simple. Opinions differ as to which of the popliteal bursæ is most frequently affected. Usually the enlargement affects one of the inner group. The practical consideration remains that any one of them may be enlarged, or indeed several may be simultaneously affected. Frequently found in arthritis of the joint of the so-called "rheumatic" variety, these swellings are also met with in conditions in which the joint moves readily and painlessly, without creaking and other signs of articular degeneration. In a minority of cases signs of ataxia will be found. Huge cysts filled with synovial fluid and " melon seed " bodies, may be found near the knee, shoulder, or hip in the arthritis of tabes. The slow formation, painlessness on manipulation, the elastic feeling, the tendency to reduction into the joint on bending the limb are all well known and classical signs. As regards the reduction into the articulation, this may be so free that fluctuation is obtainable from the cyst into the joint which can plainly be felt to distend in the fluid on pressing upon the cyst.

On the other hand it may be commonly enough noted that the bursal formation occupies a situation quite apart from any constant anatomical position. One of these peculiar examples is the upper part of the calf, the centre, the inner, or the outer aspect. It is difficult to believe, at first sight, that

a fluctuating swelling in the calf of the leg may be a bursa connected with the knee-joint. The temptation to assume that the swelling may be chronic abscess is great. A "lancet" is introduced, some turbid synovial fluid escapes, and the incautious operator is confronted the next day by a violent inflammation of the knee-joint; he is fortunate if the case does not end in amputation. That this is no fanciful sketch may be proved from the disastrous case quoted in Mr. Morrant Baker's classical article in vol. xiii of the 'St. Bartholomew's Hospital Reports.' A similar case happened at St. George's Hospital many years ago, and the accompanying rough sketch was taken from it. The patient was a soldier, and the swelling was

Nothing is more uncertain in my experience regarding these cysts in the popliteal space or ham than the evidence of their communication with the cavity of the joint. On flexing the articulation they may apparently lessen or disappear. Yet this may not be real, and often the rounded contour of the cyst may still be felt lying deep in the tissues on careful palpation. So, too, a cyst which apparently does not reduce at all, may be connected with the joint by a devious and narrow track, which is not the less capable of transmitting a septic inflammation to the interior.

It is, I think, a sound practical rule to observe that, surgically speaking, any of these cysts may communicate with the joint, and they should be
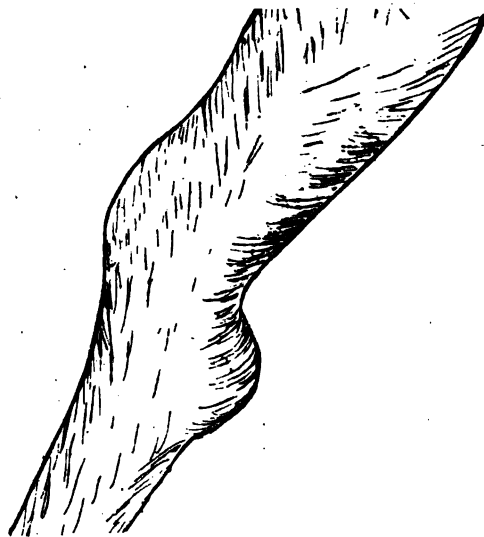
explored outside the hospital by the introduction of a grooved needle. In this case destruction of the knee also ensued. Indeed, the exploration of swellings near a joint by the grooved needle is now hardly justifiable. In a doubtful case, if tapping be resorted to, a fine aspirating syringe should be used. The skin, as a preliminary, must be rendered aseptic by prolonged scrubbing with soap and water, and the application of a spirituous solution of 1 in 500 biniodide of mercury. The needle and barrel of the apparatus must be scrupulously clean, the tiny puncture being at once closed with collodion.*

* The late Mr. Greig Smith aptly compared aspiration as too often carelessly done, to the introduction of pyogenic organisms into a cultivation medium.

treated accordingly with elaborate care and circumspection.

The following plans of treatment have been adopted in these cases :

1. Blistering and pressure.

2. Tapping with or without injections of iodine or Morton's fluid.

3. Removal.

Regarding such measures as freely opening and stuffing the cyst, the passage of setons and the like, they are obsolete and dangerous, and should not ever be employed.

The first measure is devoid of risk, but is seldom soundly curative. It may be adopted when the cyst is not very tense, and especially when relief, rather than cure is aimed at. It may be remarked

that the blistering should be severe; the ordinary pharmacopœial blisters are in my judgment far too mild for good effects.

If vesicating collodion is made up of double the ordinary strength, it is a good and reliable preparation. After the blistering, methodical pressure should be employed by means of elastic bandage.

In 1895 an elderly gentleman was brought to me by Dr. Norton, of Queen Anne's Mansions. He had chronic arthritis of one knee, and a large rather flaccid tumour in the lower part of the popliteal space. The whole articulation was the seat of aching and tenderness. The swelling obviously contained fluid, but could not be reduced into the knee-joint. The part was severely blistered, and afterwards pressure was steadily employed. The iodides of sodium and potassium were administered internally. Under this treatment the bursa gradually shrank and finally became insignificant in size, giving rise to no further trouble, and the joint symptoms greatly improved.

I have seen tapping and injection of iodine resorted to with success. I have also seen it fail, and I have witnessed severe synovitis of the knee follow this treatment on more than one occasion. The objections to the injection are the many uncertainties which surround it. If the communication with the joint be very free, one can hardly expect cure. For these reasons injection is not to be advised unless the patient should strongly object to any more definite operation. Here, again, it may be pointed out that the syringe should never have been used for exploring abscess or serous effusions. Too often, far too often, the same syringe is employed for injection of chemical agents and withdrawal of animal fluids. Some of the latter hang about the barrel of the syringe, and becoming putrid, are actually injected into the healthy tissues. The carelessness of dressers and some surgeons and practitioners regarding this vital point necessitates my calling forcible attention to it.

It commonly happens that with very tense or thick-walled cysts blistering is of little avail, or the relief given is only temporary, and the question arises, what next shall be done? In persons who lead an active life as sportsmen, officers, sailors, and those who need to use the lower limbs much in riding, walking, or athletics, cure is essential.

Increase of secretion within the bursa leads to aching and pain, and there is often a sense of pain, weakness, and strange insecurity about the joint, which is out of proportion to the size of the bursa. The sense of pain and aching is especially increased on exertion, so that the sufferers may be quite incapacitated for any active life.

The operation of aseptic excision if carefully done is free from risk, and the results are generally most satisfactory. It is an operation by no means easy to perform well, owing to the extremely thin nature of the parietes of the cyst and the difficulty of extirpation should the cyst be opened before its capsule is properly isolated. Having experienced these difficulties personally, I will now describe the operation I have found most advantageous in these cases.

Twenty-four hours is given to the preparation of the skin. The parts are first washed with ether, and then scrubbed with hot soap and water. This is followed by the application of a spirituous solution of biniodide of mercury, 1 in 500. The morning of the operation, the parts are again bathed with the biniodide and enveloped in a dressing of cyanide gauze. The instruments are boiled and placed in a solution of 1 in 20 carbolic lotion. The hands and nails of the operator and assistant are scrupulously cleaned in the usual manner.

The parts are rendered bloodless by Esmarch's method, but a boiled bandage soaked in 1 in 20 carbolic is used instead of the usual elastic bandage which is very apt to be soiled with dust or filth.

An incision is made over the swelling, and this is deepened until the actual capsule is exposed. The capsule is covered with numerous fibrous laminæ, and if these be mistaken for the cyst itself the operation is very tedious, and the dissection is apt to lead into dangerous regions. With the spring forceps the laminæ can easily be dissected away, and the true capsule of the cyst springs forward, and is known by its clear translucent appearance. The contained fluid can be readily seen. The utmost pains should be taken to expose the actual capsule and not to open the cyst itself. Now with a blunt separator, the cyst should be shelled out as far as possible. It readily separates as a rule, if the superficial incisions have been made free enough to reach its limits. Having

enucleated as far as possible, a small incision is made at the summit and the contents evacuated.

Two pair of pressure-forceps are now placed upon the collapsed sac, and it is drawn out, the separator being again used to free the irregular projection of the sac from surrounding parts. It will usually be found that a neck or process of the bursa passes deeply among the tendons towards the joint. A series of sutures of the finest chromic catgut, soaked in 1 in 20 carbolic lotion, are now passed, and when these are in position, the sac is removed by cutting with

but the present method is one that greatly simplifies the proceeding.

The following cases illustrate this mode of treatment.

(1) Large synovial cyst on inner side of knee; no obvious communication with the joint.

A labourer, æt. 48, was treated in St. George's Hospital in August, 1895, for an affection of the left knee. The articulation was weak and painful, especially after work or in wet weather. He stated that a swelling had existed over the inner side of the joint five years ago, but it gradually lessened in
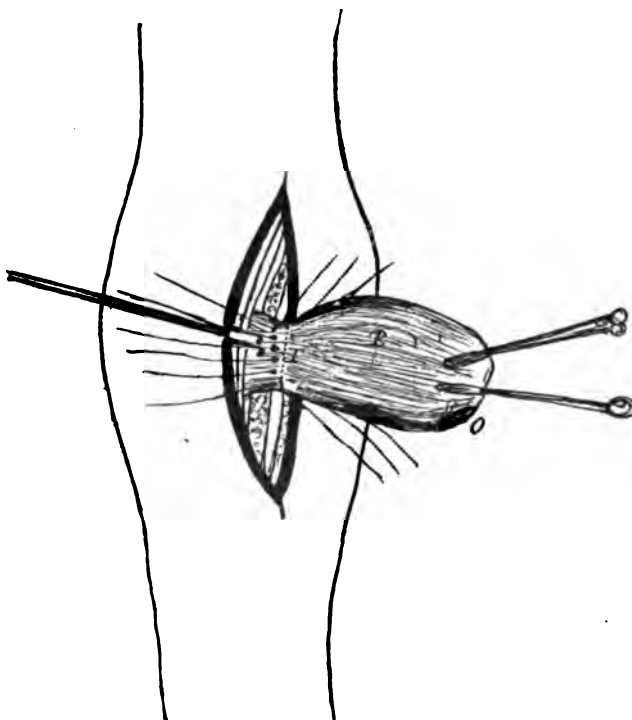
scissors in the direction of the dotted line in the diagram. A little iodoform is dusted in, the sutures rapidly tied and cut off, and thus the communication with the joint is at once permanently closed.

The wound is united. No drainage is employed, and a dressing is applied with firm pressure. A splint may be worn for the first three days. The results of this operation are very satisfactory, and it may well be applied to other joints than the knee, where bursal enlargements exist. No ·elty is claimed for the operation of excision,

size. Twelve months ago the swelling again enlarged, and in using the shovel he constantly rubbed it against the painful lump.

The patient was a healthy looking man. The knee-joint moved well. There was no excess of fluid, but slight creaking or grating on movement. Over the inner side of the right knee, near the insertion of the sartorius a swelling existed the size of a lemon. The notes by Mr. Baldwin, then registrar, state that there was no evidence of communication with the joint, the swelling being quite irreducible, but elastic and obviously containing

fluid. On August 23rd, I operated after the manner above described. The cyst was filled with jelly-like fluid. The saphenous nerve was stretched over it. A prolongation of it, the size and shape of an ordinary varicose vein ran deeply round into the ham beneath the semi-tendinosus. I have little doubt that this channel communicated with the joint, but did not 'probe,' or otherwise examine to make the point certain. Fourteen days after operation the wound was soundly healed, and the patient could move his knee. He had lost all pain and tenderness.

(2) Two cysts near the knee associated with chronic arthritis of the articulation; excision; cure.

A labourer, æt. 41, injured his right knee five years ago. He was treated as an out-patient at St. George's Hospital, but his knee never got quite well. Swelling and pain occasionally occurred ever since.

On examination, there was obvious arthritis of the right knee. It creaked and grated on movement, and the margins of the articular ends were thickened and lipped. On the outer side of the joint, near the head of the fibula, was a tense elastic cyst of elongated form, the size of a man's thumb. It closely resembled a large pouched varicose vein. This had existed for nine months. On the inner side of the popliteal space was a second cyst about the size of a small orange. This obviously communicated with the joint, being easily reducible. At the operation, on August 20th, the external cyst had a narrow sinuous neck, which passed deeply beneath the biceps tendon and was there sutured. The posterior and internal cyst freely communicated with the joint by a pouch-like opening. Both cysts contained slightly turbid synovial fluid. The wounds rapidly healed. Three weeks afterwards the patient could walk easily and well.

(3) Large cyst near the head of the fibula; excision; recovery.

A gardener, æt. 40, had a swelling near the head of the fibula for about four years. It had become gradually increased, and so tender and painful he could not work or use the limb.

On examination, there was no grating or creaking of the joint. To the inner side of the head of the fibula was a large tense elastic cyst, very irregular in outline, for it also bulged anteriorly in front of the insertion of the biceps tendon. On flexing the knee and making pressure, the cyst obviously lessened in size. At the operation the bursa was found to pass very deeply into the popliteal space; numerous lobe-like prolongations of it were enucleated, and a broad neck seemed to pass deeply in the direction of the popliteus tendon. The real depth of the cyst disclosed at the operation was in striking contrast to its apparently superficial situation. The neck was sutured, and uninterrupted convalescence followed. In this case the patient rapidly gained the use of his leg. I have since operated upon three other cases with good results. One of the cysts was of very large size. There was nothing unusual in the progress of the cases. They made an easy recovery.

In conclusion, I wish to point out that removal of bursal cysts from the neighbourhood of any large joint, as the knee or elbow, are not simple operations. They are associated with the inevitable risk of sepsis, and the responsibility of the operator is very great. Occasional disasters occur to operators of the greatest care and experience in the surgery of the knee. This teaches us two things, firstly, that the perfect technique of an aseptic operation can only be acquired by very scrupulous care; secondly, that the doctrine of auto-infection has perhaps more to do with the failures of aseptic cases than is generally believed.

When we know that a blow upon a bone of a young lad may be followed by acute infective periostitis, it is rational to assume that an operation might in such an individual result in pyogenic inflammation, though performed in quite an aseptic manner. For these reasons, it is well before operating upon a popliteal bursa to correct any faulty method of dietary or living on the part of the patient, especially alcoholism. If the parts are inflamed already, as by a careless puncture or injection, the operation ought certainly to be postponed.

Bites of Insects.—

R Ichthyol 1.0

    Aq. destill. 5.0

D.S.—To be painted on.—*Revue de Thérap.*—*Der Kinderarzt*, 1897, lxxxix, 119.

THE OPOTHERAPY OF TETANUS.

THE series of researches just published by Wassermann and Takaki, says a writer in the ' Presse Médicale' for January 22nd, are not only very important, but even destined to overthrow, perhaps, the present theories on the mechanism of artificial immunity.

. According to these authors, if the tetanus antitoxine is nothing but the product of certain dissolved parts of the cells of the medulla, an emulsion made with the normal medulla should neutralise the toxine in question. The experiments practised in this direction have fully confirmed this hypothesis by showing that the medulla and the brain of normal animals (man, guineapigs, rabbits, pigeons, horses) not only neutralise the tetanic toxine, but even exercise an immunising and a therapeutic action on animals that have been poisoned with the tetanus toxine.

The author's experiments were made on mice, and the tetanus toxine in a glycerine solution which they used killed these animals in doses of o·oo1 of a cubic centimetre.

The experiments concerning the antitetanic action of the cerebral substance were conducted in such a way that the fatal dose, or one which was two, three, or ten times as large, was mixed with a certain quantity of emulsion of medullary or of cerebral substance from a healthy animal, and the mixture was injected under the skin on the animal's back. Check animals were injected with the tetanic toxine mixed with serum or with an emulsion of hepatic, renal, or splenic parenchyma from animals also healthy.

These experiments showed that, whereas the animals tolerated with impunity the injections of tetanic toxines mixed with the emulsion of medullary or cerebral substance, all the check animals died.

In these experiments, moreover, it was ascertained that the antitetanic properties of the normal brain were much more pronounced than those of the normal medulla.

In these experiments it was seen that a cubic centimetre of an emulsion of the cerebral substance completely neutralised a dose ten times as large as the fatal dose of tetanic toxine ; that the addition of a cubic centimetre of cerebral emulsion to a dose of toxine sixty times as large was sufficient to retard considerably the occurrence of the tetanic symptoms in the animal into which this mixture was injected; and that the addition of a cubic centimetre of an emulsion of the medullary substance did not completely neutralise a dose of toxine three times as large as the fatal dose.

On the other hand, it was ascertained that the animals into which a certain quantity of an emulsion of the normal cerebral or medullary substance was injected, bore with impunity the ulterior injections of doses of toxine from three to five times as large as the fatal dose, made twenty-four hours after the injection of cerebral substance; and, besides, that the injection of normal cerebral substance into mice, from four to six hours after the injection of a fatal dose of tetanic toxine, led to the recovery of the animals.

The experiments made with the cerebral or medullary substance of the guinea-pig, the pigeon, the rabbit, the horse, and man showed that in the entire series the central nervous system possessed antitetanic properties.

In referring to the experiments on the check animals, in which no antitetanic properties were shown, the writer thinks it is a singular fact that the antitetanic properties were absent in the liquid of the emulsions of the cerebral or medullary substance, which was filtered by the centrifuge, as well as in the ventricular liquid.

In order to explain all these truly extraordinary facts, Wassermann admits that there exists a peculiar affinity between the tetanic toxine and certain cellular complexes of the central nervous system, and that this affinity is manifested not only in the case of the central nervous system of the living organism, but also in that of the dead spinal medulla and brain, that is to say, isolated, separated from the organism. In case of an injection of an emulsion of these organs, that is when the cerebral substance circulates with the blood, the tetanic toxine which has penetrated the organism, finding, so to speak, the nervous substance in circulation, is combined with it before proceeding to exercise its action on the cellular elements of the central nervous system, which is thus spared.— *New York Medical Journal*, February 26th, 1898.

DR. TIBBLES' VI-COCOA.

ARTICLE No. 1.

Ignorant Statements Refuted.

WHEN a happy idea occurs to an inventor there are always persons who are ready to disparage the discovery, especially if it cannot be imitated with success.

The introduction of a combination which possesses several advantages over ordinary Cocoa has met with such unparalleled success, that it has evidently aroused the jealousy of other Cocoa manufacturers.

The use of malt and hops in the form of beer is almost a characteristic of the British people, but the rapid spread of temperance principles has deprived many people of the use of these two valuable products in the form of a beverage.

It is difficult to make liquid preparations of malt and hops that will keep, without the use of alcohol or some other equally objectionable preservative. Consequently the idea of combining them in a solid form with Cocoa, so that on the addition of water or milk they would form a beverage, containing the properties and possessing the advantages of all three, has naturally met with the success it deserves.

Kola is not so widely known as malt and hops, hence possibly the ignorant and erroneous statements that have been circulated by a badly informed writer, who does not sign his name, in an almost unknown medical journal, but which we regret to find have been quoted by a well-known firm of Cocoa manufacturers, as if the statements were true.

Kola has been carefully analysed by English and French chemists of the highest reputation. In any modern work on the chemistry of vegetable substances the information may be found that Kola contains the same active principle as Cocoa itself, viz. theobromine, as well as caffeine, the active principle that occurs in tea and coffee.

In most tropical and subtropical countries some plant or other containing these active principles has instinctively been chosen by the natives as a national beverage. The use of coffee, extending originally from Abyssinia and Arabia, has become more or less general over the civilised globe as a brain stimulant. The use of tea, originating in China and Japan, has also spread over the world, more especially in English-speaking countries and English colonies, more perhaps as a restorative and aid to muscular exertion than as a brain stimulant.

In the Argentine Republic and southern parts of South America millions of pounds of Paraguay tea, prepared from a kind of holly, are used similarly for making tea, and in northern parts of South America, especially in the districts of the Amazon, Guanana is employed for the same purpose. Throughout Western Africa, extending southward to the Angola and eastwards to the Soudan, Kola nut has been described by the earliest travellers, and up to the most recent date, as used by the negroes for the same purpose as tea. Indeed, the seeds have been carried by them in past times and planted in the West Indies and other countries where the negroes were taken as slaves.

All these substances contain caffeine as the active principle, but each differs in the presence of small quantities of other constituents, which cause the well-known difference in the effects of tea, coffee, and Paraguay tea. Tea is apt to cause indigestion and nervousness in some people, coffee is liable to produce constipation in others, but Kola, whilst it has not the aroma of coffee or the fragrance of fine tea, is without the disadvantages of either, and therefore, by its addition to Cocoa, gives to that beverage the advantage of caffeine as a restorative and stimulant without the disadvantages of either.

In proof of this statement we may quote from a paper on Kola by Dr. Daniell, who was for some time a resident in West Africa, and who says in the *Pharmaceutical Journal* (1865, 2nd series, vol. vi, p. 450), "One remarkable feature worthy of attention is the marked avidity displayed by the negro inhabitants of Sierra Leone and Portuguese colonies for the nuts in preference to the beverage of tea and coffee, although these contain the same alkaloid."

The Kola tree is nearly allied to the Cocoa tree, for both belong to the same family of plants, and contains the same active principle, but in smaller quantity, with the addition of as much caffeine as is found in good tea and coffee.

The *British Medical Journal* says, "Vi-Cocoa is a very palatable beverage of great stimulating and sustaining properties." The *Lancet* says, "Vi-Cocoa must be assigned a place in the front rank of really valuable foods, since it is the embodiment of all the numerous principles contained in Malt, Hops, Kola, and Cocoa; . . . of distinct value as a restorative and stimulative food."

Merit, and merit alone, is what is claimed for Tibbles' Vi-Cocoa, and the proprietors are prepared to send any medical man on application (a post-card will do) a large sample tin of Tibbles' Vi-Cocoa free and post-paid, also a little book containing the reports of the very highest medical experts and analysts in the United Kingdom, showing the advantages of Dr. Tibbles' Vi-Cocoa over all other food products.

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NOTICE.

THE PRINCIPLES OF THE TREATMENT OF DEFORMITIES BY INSTRUMENTS.*

BY

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Assistant Surgeon at the North-West London and City Orthopædic Hospitals.

BEFORE adverting to the chief principles that govern the use of instruments in the treatment of deformities, it would be well to recall the fact that orthopædic surgery has for its object not only the cure of existing deviations from the normal form in the limbs and such other parts of the body as are concerned in locomotion and other mechanical functions, but the prevention of deformity when conditions are present that will certainly lead to its occurrence unless suitable measures are adopted.

The mechanical actions of any orthopædic appliance may be classed under one or more of the following three headings :

1. Retentive; apparatus designed to prevent threatened displacements.

2. Reducing ; designed to restore crooked parts to their normal form and function.

3. Supplemental ; apparatus such as springs and elastic bands that replace the action of paralysed muscles, and prothetic apparatus that takes the place of amputated limbs, &c.

Whenever it is compatible with obtaining the best possible result the instruments should be so constructed that they allow the patients to walk and follow the vocations proper to their age. The component parts of portable appliances are (1) the fixing, and (2) the active parts.

Let us take as a familiar example of an orthopædic appliance that given by Andry † in his—the first—book on 'Orthopædic Surgery.'

* A lecture given at the City Orthopædic Hospital, February 15th, 1898.

† Andry, ' Orthopédie,' 1741.

One of the quaint illustrations in this notable work represents a sapling with a bent stem which is bound to a strong stake at its middle and upper extremity, whilst the stake is fixed to the lower end of the tree by being thrust into the ground. In this instance the deformity of the trunk of the growing sapling is prevented from increasing, and if the middle band were tightened from day to day the stem would gradually assume an erect position, which daily increasing thickness and strength would soon enable it to maintain without the assistance of the supporting stake.

This is a familiar example of the simplest form of apparatus—the rigid straight splint. If instead of the curved stem of the sapling we take two common rickety deformities, such as outward bowing of the tibiæ and knock-knee, we see that the same principle, that is a rigid splint properly used, can be successfully applied during the period of the patient's growth. The splints employed for these conditions at this hospital have one most
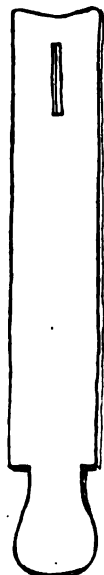
Fig. 1.—Wooden splint for knock-knee.

important feature: they are so constructed and applied that *the patient can walk about with perfect ease and comfort whilst wearing the splints.* This ambulant method of treating rickety deformities of the bones may seem to contradict the surgical axiom that in rickets, when the bones of the leg are 'ding to pressure, the child should be kept "off :et." There is no real contradiction, and nent both by rest and by the ambulant

method is frequently required in the same case. There is no difficulty in deciding when a child is fit to bear suitable "walking apparatus." He requires it as soon as he insists on walking.

Rest is required when the rickety process is most active, *i.e.* when the softening of the bones is very great. But rickets is not a matter of five or six weeks, or even as many months, under the best of treatment; in many cases the bones remain for years below their proper resisting power, and it is in cases of rickets, whether of moderate degree originally or remaining so after treatment of a
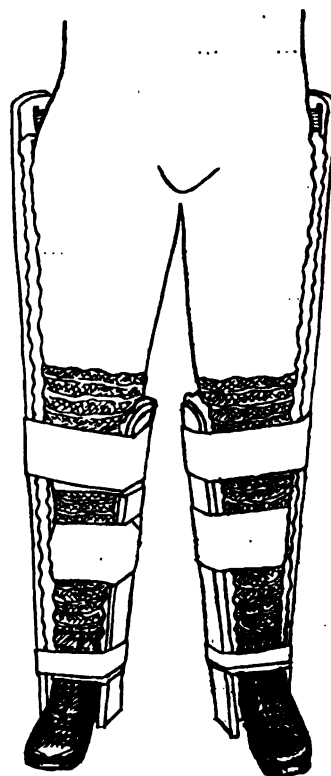
Fig. 2.—Wooden splints applied in a case of double genu valgum and double outward tibial curve.

more severe stage, that apparatus that admits of walking must be used.

Mechanical treatment, always accompanied by proper diet and hygiene, and medicinal remedies, allows of the child's going to school, and so removes a great additional disability. To consider more closely one example of the use of portable apparatus, a case of knock-knee may be taken. The simple wooden splint shown in Fig. 1 is the form employed at this hospital.

It is worn by a vast number of our out-patients, and is managed with perfect success by the parents under the periodical supervision of the staff. It is readily combined with the splint for outward bowing of the tibia, a frequent concomitant of knock-knee, as shown in Fig. 2.

The last patient whom I discharged as cured of this double deformity was a little girl aged 5, who had worn the splints for two years. Not a trace of either deformity remained. The perfection of form resulting in this and many similar cases that have passed through my hands has convinced me of the undesirability of performing operations such as osteoclasia or osteotomy whilst rickets is still in progress and the patient is growing. Only when the disease has ceased and the bones have become hard should osteotomy be performed.

These simple and inexpensive wooden splints answer all the indications for surgical treatment, but still they are not so perfect in point of portability as well-constructed steel instruments. The chief points in an instrument of this class adapted to a case of knock-knee may now be examined (see Fig. 3).

The fixing parts of the apparatus are at the pelvis and the foot. These are joints opposite the hip and ankle. The active part is opposite the knee, where the steel must be rigid when the child is standing, and the knee must be pulled outward to the splint by fastening the straps of the knee-cap. In order to enable the patient to sit comfortably there may be a joint at the knee, which can be locked and unlocked according as the patient stands or sits. This effect is obtained by the "ring-catch" joint as shown in Fig. 4.

A further convenience is to have the adjustment of the steel to the boot so made that the latter can readily be detached. This may be effected by either of the joints shown in Figs. 5 and 6.

It may be asked whether the child does not soon grow out of the instrument. This is provided
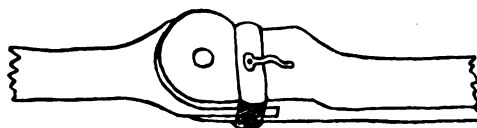
Fig. 4.—The "ring-catch" joint.

Fig. 5.
The detachable pivot-joint.

Fig. 3.—(a and b) Steel walking instrument for a case of double knock-knee.
(a) The metal parts (1, 2, 3, the joints); (b) the complete instrument fitted to boots.

for by the structure of the thigh and leg pieces, which are made of overlapping rods of steel fastened by screws near the end of one, and by a loop at the end of the other (see Fig. 7).

Another question I am frequently asked is, "Should the instrument be worn at night?" The rate at which the deformity disappears is certainly increased by suitable instruments being worn at night. The steel apparatus should, however, be replaced by a simple splint for the night.
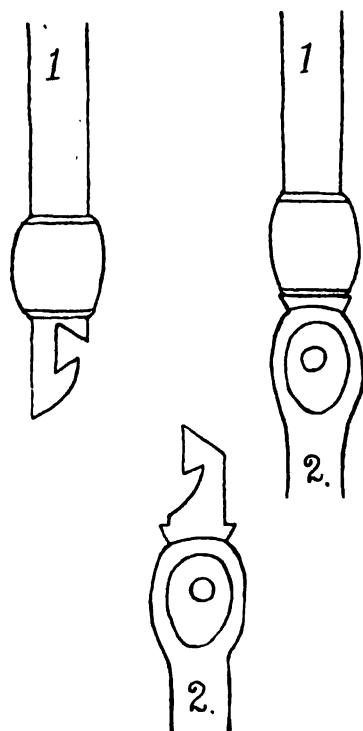
Fig. 6.—The bevelled mortise-joint.

There are other refinements that might be mentioned in the structure of the steel walking apparatus, but the chief points have already been detailed, and time does not allow of more.

The principle of the rigid splint with the addition of progressive alteration in form is seen in the useful "tin" splint. I have purposely put its rigidity as its most important feature; if such splints are made too flexible they do not answer their proper function. An example of the use of the splints may be taken in a case of congenital equino-varus in which treatment is begun, as it should be, within the first few weeks after birth.

Even where this is not done, and treatment is

neglected for a year or more, the eversion, much of the "cavus," and some of the "equinus" can be overcome by careful splinting. Such a case is shown in Fig. 8, at its middle stage of treatment.

When all the varus has been removed, an antero-external splint may be applied, as shown in Fig. 9, in order to remove any of the hollowness of the foot that remains, and some of the equinus.
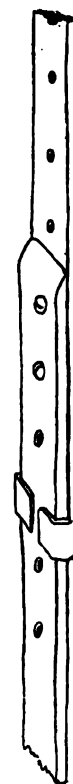
Fig. 7.—The method of elongating parts of the steel instrument.

It must be remembered that both these splints are used as levers, and that their fulcra should be the sides of the leg and not the external malleolus or other bony prominence.

The same principle of rigidity combined with progressive alteration in form is seen in Scarpa's shoes. Their functions in infants can be served in every way by means of the tin-plate splints just referred to, but in older children and adults in case of club-foot, whether congenital or due to infantile paralysis, Scarpa's shoes have still a useful function. The simplest form of Scarpa's shoe is shown in Fig. 10.

Some of my hearers may ask me whether this method of gradual correction of the varus before operating is not somewhat old-fashioned, and whether it has not been superseded by a more rapid plan. It is true that many surgeons dispense with the gradual correction preliminary to operation, and, indeed, in the earlier period of my own surgical work I followed the modern plan of dividing the tendo-Achillis, the tendons of the

Fig. 8.—*a*, the leg and foot of a child aged 2 years showing equino-varus; the latter reduced to one half the original amount. *b*, the same with an external malleable splint applied; the varus is corrected. For the sake of clearness the splint is represented as applied by strapping, whereas in practice only a bandage is required.

tibiales muscles, and such other tendons as might seem to require it, the plantar fascia, the internal lateral ligament of the ankle, and other ligaments, and put up the foot in a corrected position in plaster-of-Paris, which was renewed from time to time, an improvement in the form of the foot being obtained at each renewal of the plaster case. After

giving the modern method a very patient and extended trial, I have found that in bad cases, at any rate, it is incapable of giving perfect results, and is in this important matter much inferior to the old-fashioned method I have referred to above. As one of the criteria of a good result in club-foot it is instructive to take prints of the soles of the feet by making the patient stand first on a flat plate blackened by soot, and then on a sheet of paper. In this way the impressions reproduced in Fig. 11 were obtained.

Fig. 9.—Antero-external malleable splint applied in a case of club-foot.

At first sight these impressions may seem to be abnormally flat; but it is to be remembered that the arches of the foot are but little developed in infancy, and in fat children the impression corresponds to the whole of the sole of the foot, and does not show the hollow seen in the normal feet of adults.

In passing I would mention that the treatment of congenital club-foot does not cease when the malposition has been corrected. For two years or more the child must wear walking instruments such as those shown in Fig 12.

Splints, then, may be used to correct both bony

curvature and malposition of joints. Of splints for the latter purpose, one more example may be cited in the familiar Thomas's splint for the hip-joint. This admirable splint is fixed above to the trunk, and is designed to bring the femur in a line with the trunk by bandaging the thigh and leg to its lower half. How often do we witness the error of making the splint conform to the deformity instead of *vice versâ!* This splint also is used as a lever until the limb comes straight; afterwards it is used as a retentive appliance.

and an inside T-strap, and in this way restore the arch in cases where exercises and other measures have failed to effect any improvement.

Can we find a support for the yielding vertebræ in scoliosis? There are surgeons who condemn the use of apparatus in any case of lateral curvature, and there is some ground for this view, since many of the corsets and other appliances are heavy, and by surrounding the thorax they restrict the movements of the ribs, and so impair the respiratory movements, and hence the general health of the
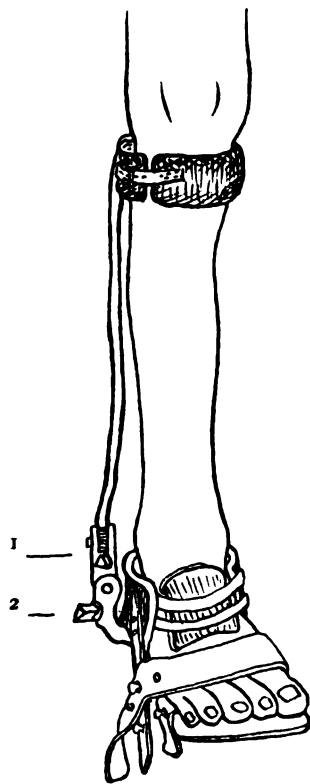
Fig. 10.—A simple form of Scarpa's shoe. (1) Rack producing flexion at ankle; (2) rack for everting the foot.
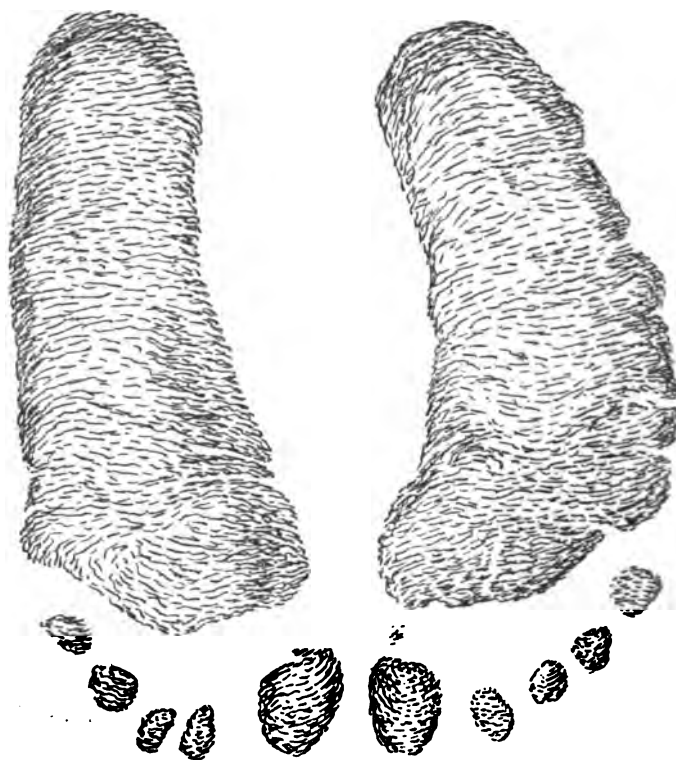
Fig. 11.—Impressions of feet of a child aged 2 years, after eighteen months' treatment for congenital equino-varus.

The principles of the simple splint are applicable not only to the long bones and the joints of the limb, but also to the spine. Let us take as an example a case of scoliosis or lateral curvature of the spine, as it is called, though it involves in addition to the lateral deviation a morbid rotation of the vertebræ.

In flat-foot we can support the falling arch by a rubber pad, and hold the foot to the pad and prevent eversion of the ankle by an outside iron

patient. Some are provided with crutches which press into the arm-pits, and so, if they act as supports at all, it is at the expense of pressure on the nerves of the brachial plexus, as shown by numbness and tingling in the patient's fingers, and weakness in the hands and arms.

The splint introduced in 1852 at this hospital by the late E. J. Chance, and which has since been improved upon, is the only one I have found of service in such cases. The diagram (Fig. 14)

shows its principle of action as applied to an ordinary case of lateral curvature.

A firm pelvic band (1) rests by a projection on the chair when the patient sits, and has attached to it a firm steel upright which, when seen in profile, is slightly curved to the shape of the normal profile of the spinal column. The upright ends at the level of the shoulders in a pad, from which bands (2) pass round the shoulders holding back the upper part of the thorax and undoing the "stoop," which forms a most important element in

of exercising the patient, and it does not necessitate any loss of time from school or employment. It may also be remarked that in the sitting position the splint, if properly made and applied, acts in a manner similar to but more perfect than the special couch, which is the instrument employed by some who appear to be under the impression that they treat scoliosis by exercises alone. It is in scoliosis from rickets and infantile paralysis that from the pathological cause underlying the deformity support is most imperative. In other cases
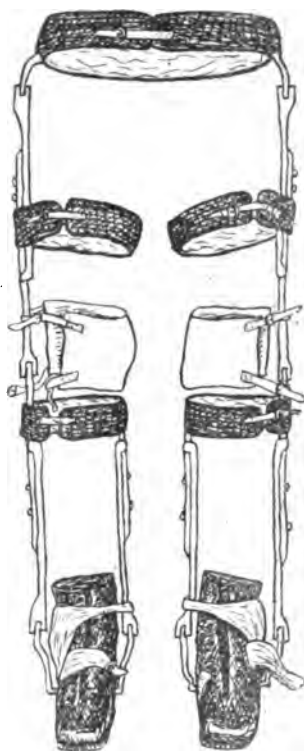
Fig. 12.—Walking irons and boots for use after the correction of equino-varus. The padding of thigh-irons is omitted for sake of clearness.

scoliosis. An abdominal band (3) is fixed to the lumbar part of the instrument, and tends to correct the "lordosis" which accompanies the lumbar curve. Finally, padded metal plates are adjusted when the patient is holding herself in the best position she can assume, so that she cannot fall back into it and allow further deviation to occur. The plates act also as guides to muscular self-correction on the part of the patient. This instrument is lighter than any support of poroplastic felt that I have seen; it is easily removed for the purpose

measures will, as in cases of adolescent knock-knee and flat-foot, make all the difference between success and failure in treatment.

I have only had time to touch on the more prominent and important of the ways and means of orthopædic practice. Perhaps the most important principle, of all may be expressed as follows :—Use the simplest means that will insure the desired result ; avoid unnecessary complexity of mechanism, but at the same time be master of its judicious employment combined with other

every mechanical principle, so that when required it may be ordered for the benefit of the patient.

Much irritation is not infrequently present in the relations between surgeon and instrument-maker. None need in reality exist; where both understand their work the relation need only be similar to that between physician and dispensing chemist,—the former acknowledges the skilful help of the latter without asking from him direction as to the treatment of the case. The practice of a past generation of physicians, namely, to send the patient directly to the instrument-maker, still lingers in many quarters, with the result that the mechanician is forced to assume the *rôle* of the surgeon; and too often the patient suffers from ill-directed measures, and pays for unnecessarily complex appliances.
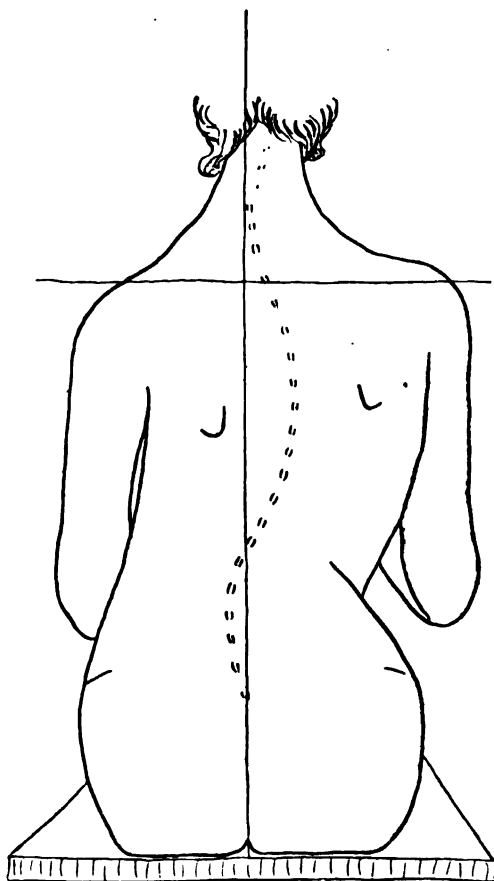
Fig. 13.—Outline sketch of the back of a young woman suffering from lateral curvature of the spine.
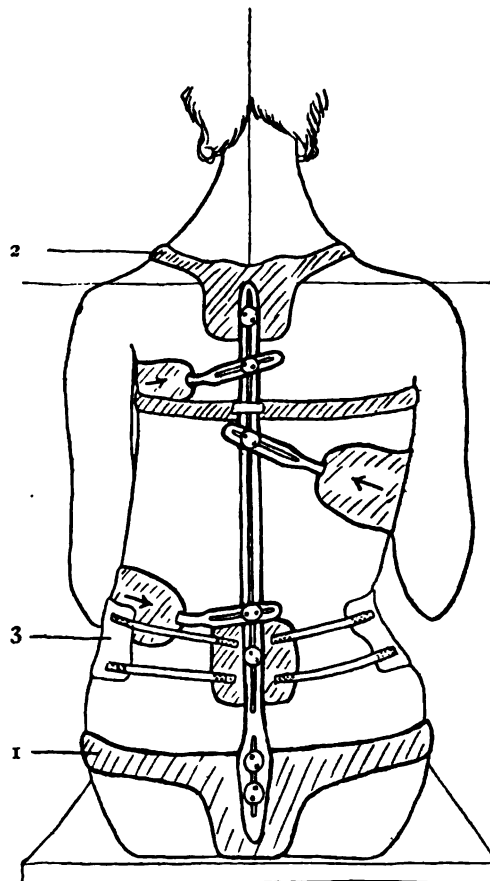
Fig. 14.—Diagram showing the principle of Chance's splint for lateral curvature as applied to the patient shown in Fig. 13. (1) Pelvic band; (2) shoulder-strap; (3) abdominal band.

The Trendelenburg Posture in Operations about the Nose and Throat.—The advantages claimed for this position are that preliminary tracheotomy is usually unnecessary in the major operations; a good view of the mouth and pharynx can be obtained; the blood does not flow into the larynx or pharynx, and so greatly diminishes the danger from aspiration pneumonia on the one hand and the vomiting of swallowed blood on the other; and, furthermore, that there is less difficulty in giving the anæsthetic.

Laryngoscope, vol. iv, p. 65.

ON THE TREATMENT OF UTERINE MYOMATA (FIBROIDS).

BY

J. BLAND SUTTON.

LECTURE VII.—OÖPHORECTOMY *v.* CONSERVATIVE HYSTERECTOMY.

IT was an excellent effort of reasoning which led Lawson Tait in 1872 to the deduction, that as uterine myomata usually cease to grow after the natural cessation of menstruation, it would be useful to induce an artificial menopause in patients with uterine myomata, by removing their ovaries. He not only conceived the idea, but possessed the ability necessary to carry out the operation and convince the whole surgical world of the soundness and utility of the proceeding.

In the quarter of a century which has elapsed since Tait's epoch-making discovery, the surgery of the female pelvic organs has been brought to a high state of perfection, and hysterectomy can be performed with almost the same safety as oöphorectomy. In my own practice, whenever it is possible, I actually reverse the conditions, and instead of removing the ovaries and Fallopian tubes, leaving the uterus with its tumour, I often find it safer and certainly better surgery to remove the uterus and tumour (conservative hysterectomy), leaving the patient at least one ovary with the corresponding Fallopian tube. These views I communicated to the Obstetrical Society, London, November 3rd, 1897, and it is very gratifying to me to find that Dr. Howard Kelly, Baltimore, has also carried out a similar plan of conservative hysterectomy with equally gratifying results (*vide* ' Brit. Med. Journ.,' January 29th, 1898).

There are very clear indications that hysterectomy will very rapidly supersede oöphorectomy in the treatment of myomata, and this is due to an improvement in the treatment of the uterine stump, for which we are mainly indebted to Baer.

When ovariotomy became an established operation in surgery, it was natural that enterprising surgeons should attempt to deal with formidable uterine myomata on the same lines. A study of the earlier literature of ovariotomy shows that in very many cases large uterine myomata were often successfully treated, but the surgeon believed that

he was dealing with an ovarian tumour. This was during the " reign of the clamp." With the introduction of antiseptics and the short ligature, it soon became clear that whilst this method gave wonderfully improved results with ovarian tumours, the consequences were woeful in the case of uterine stumps ; and in spite of much ingenuity in ligaturing the uterine tissue it was found that the clamp and the serre-nœud furnished the safest course. In a very large proportion of cases the neck of the uterus, consisting so largely of muscle-tissue, could not be securely constricted by transfixion ligatures as is the case with the thin pedicle of an ovarian tumour. Many attempts were made by surgeons to secure the ovarian and uterine vessels separately so as to avoid the necessity of transfixing the cervix, but the best and most successful method was introduced by Baer in 1892. This surgeon found that when the uterine arteries were secured in the broad ligaments the bleeding from the cervix was in most cases effectually controlled ; and the best method of preventing the cervix from sloughing was to interfere with it as little as possible, and certainly not to strangle it by tight encircling ligatures.

Since this date hysterectomy has entered on a new and wonderful career, and the method can be applied even to those formidable varieties of myomata which could not be treated by clamp or serre nœud, and which offered the greatest operative difficulties to oöphorectomy.

It is necessary to consider in detail why oöphorectomy, which has given good results in the past, should be abandoned in favour of hysterectomy. The objections to oöphorectomy may be arranged under four headings :

1. It is not always practicable to remove both ovaries.

2. The relief is neither prompt nor certain, whereas convalescence is quicker and more satisfactory after hysterectomy than after oöphorectomy.

3. The mortality of oöphorectomy is scarcely less than that of hysterectomy.

4. It is a greater disadvantage for a woman to lose her ovaries than her uterus.

I will deal separately with each of these objections.

1. *It is not always practicable to remove both ovaries.*—This difficulty is admitted by the most ardent advocates of oöphorectomy. Often the

removal of both ovaries is a very simple matter. In a very large proportion of cases the removal of the appendages on one side offers no difficulty, but on the opposite they are insurmountable, and in a few instances the ovary cannot be found. When the layers of the broad ligament are widely separated by a myoma, the difficulty of applying ligatures is very great, and this increases the risk of hæmorrhage. Even the most experienced and skilful surgeons have undertaken operations with the view of removing the ovaries, but on account of difficulties in securing the vessels, have been compelled to perform hysterectomy.

2. *The relief is neither prompt nor certain.*—It is admitted by all who have devoted careful attention to the effects of double oöphorectomy on uterine myomata that the most beneficial results have followed this operation in cases where it was performed for the relief of profuse menstruation. In Lecture III it was pointed out that the submucous variety of myomata was the one most commonly associated with excessive menstruation; in very many cases it has happened that women have been submitted to oöphorectomy, and that after the operation the recurrent bleeding continued unaltered, then the uterine cavity has been dilated and a small polypus extracted, with the effect of staying the "issue of blood." Anyone who can boast of experience in dealing with myomata has been astonished to find that a woman may have a myoma in her uterus as big as her head which causes her very little inconvenience, yet her life is placed in jeopardy during each menstrual period by a submucous myoma no bigger than a cherry; yet the larger tumour has so distorted the uterine cavity that it was impossible to reach it by the vaginal route; oöphorectomy was equally ineffective, and hysterectomy alone had the effect of staying the monthly loss.

No one has attempted to explain why removal of the ovaries causes uterine myomata to shrink. They rarely disappear completely. The rapidity with which some myomata have shrunk after the operation has also astonished me. That this effect follows complete removal of both ovaries in a very large proportion of cases is one of the best attested facts in surgery, but no one has made any efforts to work out the details of the process. I have noted in many instances in which I performed oöphorectomy for large tumours that a slightly

sanguineous fluid persistently escaped from the vagina many months after the operation, and that some of my best results were in patients who reported the existence of this flow. In one case a patient from whom I removed both ovaries was so annoyed by this discharge for a period of two years, that as the myoma had shrunk to a small body I dilated the uterus and enucleated the remnant. At the time of the oöphorectomy the myoma was as big as a cocoa-nut; the shrunken tumour equalled a billiard ball in size, and was partially calcified. In a few cases in which I have examined uteri removed from patients who have had hysterectomy performed a year or more after double oöphorectomy, I have found evidence of necrotic changes in the tumours; in two instances the shrivelled tissue was calcified, and in others the remnant of the tumour, instead of being firm and hard as myomata usually are, possessed the toughness of a solid india-rubber ball.

I am further convinced that the shrinking of myomata after complete removal of the ovaries is in essence a necrotic process, by the fact that even the most carefully conducted antiseptic or aseptic oöphorectomy is followed by irregular rises of the bodily temperature such as rarely ensue on an ovariotomy or supra-vaginal hysterectomy conducted in the same manner. These changes, too, explain to my mind why the convalescence is so prolonged. I have had series of cases in which patients after ovariotomy or supra-vaginal hysterectomy have left their beds in eighteen days, but an oöphorectomy patient requires to keep in bed for twice that period before her temperature resumes the normal range.

3. *The mortality of the operation.*—Here we are face to face with a very difficult question. It is not by the rate of mortality in the hands of one expert operator, or by the results obtained in one hospital, that the risks of any operation can be judged, but by the results of a large number of operations " complete and incomplete " impartially published by many operators.

In experienced hands the risk of double oöphorectomy for myomata is that of ovariotomy. In the practice of less experienced operators it is much greater than ovariotomy. Then, again, this question is not to be judged merely by statistics. I have carried out a double oöphorectomy where it could be done as easily and as safely as the simplest

ovariotomy; on the other hand, I have undertaken operations for the purpose of removing both ovaries, but found the condition so embarrassing that I removed the uterus and left the ovaries because it was the safer and simpler operation.

However, this much is certain, the technique of hysterectomy is now so near perfection that there is less risk in removing a myomatous uterus than there was five years ago in the performance of double oöphorectomy; and during the next few years there are good grounds for the hope that it will rival ovariotomy, which even at the end of 1896 had in the hospitals of London a mortality varying from 5 to 18 per cent.

4. *It is a greater disadvantage for a woman to lose her ovaries than her uterus.*—To deprive a woman or a man of any organ is always a matter of regret, but when it is not an organ essential to life, and is incapacitated, troublesome, and dangerous from disease, then such considerations are not seriously taken into account; but it is a grave proceeding to remove two healthy organs to relieve one that is diseased, when it is practicable to save them by removing the unhealthy organ itself.

It is a very great advantage to remove a myomatous uterus and preserve one or both ovaries, for it is evident that an ovary serves other duties than yielding ova.

The advantages of leaving at least one ovary were referred to in Lecture VI, and there is no necessity to repeat them here; but it is necessary to mention that one of the most important results appreciated by those who have practised conservative hysterectomy for uterine myomata is the remarkable improvement in the general health of the patients, which is quite independent of the relief to the mechanical troubles. It seems that a myoma, even when it does not drain patients by oft-recurring menorrhagia, impairs their vitality and induces a condition which they express by the phrase "never feeling quite well." After extirpation of the tumour the restoration to health is accompanied by increased vigour, which is to them a revelation.

Pan-hysterectomy. — A careful perusal of the literature relating to abdominal hysterectomy makes it clear that there is a very important question to decide, viz., *the superiority or otherwise of supra-vaginal hysterectomy over pan-hysterectomy.*

Pan-hysterectomy signifies the complete removal of the uterus and its neck by the abdominal route. I do not venture to discuss this method as I have never performed it. I have seen other operators carry out this procedure, but have not felt disposed to perform it myself on account of the great risk of wounding the ureters. Having seen the ureters damaged by several operators I have good grounds for my caution. On many occasions I have made a careful examination of patients on whom I have performed supra-vaginal hysterectomy, and found the vaginal portion of the cervix mobile and natural in size and colour, and have failed to find any objection to its retention. Apart from its peculiar risks to the ureters, pan-hysterectomy is a long and tedious operation, requiring in some cases two hours for its performance, for which in my judgment there is no compensation either in greater safety or in remote consequences.

Some critics in reviewing my writings on hysterectomy complain that I make light of the operation; this is contrary to facts. I contend that conservative supra-vaginal hysterectomy is based on sound anatomical principles, and in some instances can be carried out with relative ease and freedom from anxiety by an operator of experience in abdominal surgery. But in many cases, and especially in large cervix-myomata and those which burrow between the layers of the broad ligament, where their removal is most imperative, the operation is fraught with difficulties and dangers which test the resources of the boldest and most skilled, and are among the most difficult of all surgical enterprises. They well illustrate a surgical proverb in regard to operations—" The greater the necessity, the greater the danger." It is, however, a matter of congratulation that some of the most brilliant operative results of recent years have been won in this field of surgery. In conclusion, it may be stated that two sets of factors have enabled supra-vaginal hysterectomy to vanquish oöphorectomy in the treatment of myomata; they are, *rigid asepsis and perfect hæmostasis.*

Treatment of Typhoid.—Many physicians now believe that the key to the situation in treating typhoid fever is to be found in the intestines, an opinion which Osler considers as wrong in the worst possible way, in principle as well as in practice.—*Monthly Cyclopædia*, February, 1898.

ARTHRITIS IN CHILDHOOD: ITS VARIETIES AND THEIR DIAGNOSIS.

A Lecture delivered at the Hospital for Sick Children, Great Ormond Street, by

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GENTLEMEN,—I propose this afternoon to say something about the various forms of arthritis which occur in childhood, dealing particularly with their differential diagnosis.

At first sight the subject seems a simple one. Given a child with swelling of joints, one is apt to think that the diagnosis limits itself to rheumatism, tubercle, or syphilis. But unfortunately the problem is by no means so simple, and the more one sees of the various forms of arthritis which occur in children, the more one is impressed with the difficulty of diagnosing one variety from another.

I may mention at the outset that the diagnosis of these varieties is a matter of practical importance, in some cases even of vital importance ; the treatment and the prognosis are widely different in the different forms of arthritis.

It will perhaps be most useful to take as our basis and starting-point rheumatism, and to consider the diagnosis of other forms of arthritis chiefly with reference to this. It must of course be understood that by "rheumatism" we do *not* mean a motley group of unexplained joint affections, but only the one almost certainly specific disease with which we are all familiar in its acute form as rheumatic fever, but which may have a subacute or even chronic course. I shall not attempt to define it, you are all familiar with its clinical aspect.

The diagnosis of articular rheumatism in a child is not always easy, and I may remind you that severity of joint symptoms is quite the exception in the rheumatism of childhood ; indeed, much tenderness, with swelling and redness of joints in a child, should always raise a suspicion that the condition may not be rheumatic. In children, however, certain symptoms are far commoner than in adults, and materially assist the diagnosis. In the first place the heart, as you know, is much more often affected in children than in adults, and the presence of a bruit when we can be sure it is due to endocarditis may settle the diagnosis. In fifty consecutive cases admitted to this hospital with articular rheumatism, thirty-seven had signs of endocarditis.

Another very important symptom which is found in children far oftener than in adults is the presence of subcutaneous nodules, which are almost if not quite absolute proof of rheumatism. These nodules are far commoner than the text-books might lead you to suppose. In this hospital, where every child in whom there is any suspicion of rheumatic taint is carefully examined for nodules, we are seldom without one or more instances in the wards. In the same fifty cases of articular rheumatism no less than twenty-three showed rheumatic nodules, i. e. nearly half the cases. And even if one includes cases of chorea and heart disease without concurrent articular rheumatism, the percentage is still high. In 200 children with rheumatic affections (chorea, articular rheumatism, endocarditis, or pericarditis) I found nodules in fifty-five cases, i. e. in 27·5 per cent. The rheumatic nodule, therefore, is not to be looked upon as a clinical curiosity, but as a valuable aid to diagnosis.

A point on which some stress has been laid is the history of rheumatism in the family, and undoubtedly this is of some value ; but I would warn you against laying too much stress upon it, for in London, at any rate, it is very common to get a family history of acute rheumatism where the child shows no rheumatic taint whatever. In 200 consecutive cases in which the child was admitted for diphtheria, broncho-pneumonia, &c., and showed no evidence whatever of rheumatism, a family history of rheumatic fever was obtained in fifty-nine cases, i. e. in 29·5 per cent. and if one were to include vague attacks of "rheumatics," &c., and even acute rheumatism in distant relatives, the proportion would be very much higher. (In these statistics the patient's brothers, sisters, parents, grandparents, aunts, and uncles were included.)

Another point in the diagnosis of rheumatism to which I wish particularly to draw our attention is the age.

One sees from time to time infants with swelling about the joints, who are said to have "rheu-

matism." I would venture to suggest that when you see an infant with swelling about the joints, you should always assume that it is *not* rheumatic, and you will almost, perhaps quite invariably be right. For practical purposes one may say that there is no such thing as articular rheumatism in infancy.

I am well aware that cases have been recorded in infants, even within a few weeks of birth, and some of these are attested by the highest authorities; but in England, at any rate, they scarcely seem to occur. My own experience is comparatively small; the earliest age at which I have seen articular rheumatism is three years. It has occurred in one case in this hospital at the age of two and a half years, and the observations of others with much larger experience than myself give approximately the same age for its earliest appearance.

What then are the cases which so closely simulate rheumatism in infancy? Not long ago an infant aged ten months was sent to me for "rheumatism." It had been ailing six weeks with slight swelling and tenderness about one ankle. Salicylates had been given without much improvement. On closer examination it was noticed that the swelling was not strictly over the ankle-joint, but extended over the lower end of the tibia, and there was no effusion in the joint itself. Inspection of the gums showed the bluish, spongy appearance of scurvy.

One might multiply cases where scurvy has simulated rheumatism in infants, but this one case will serve to remind you of the importance of always bearing scurvy in mind when you are tempted to diagnose rheumatism in an infant, an importance which is practical, for there are few diseases which respond so rapidly to treatment as scurvy.

Other conditions which give rise sometimes to a diagnosis of rheumatism in infants are epiphysitis, syphilitic or othewise, and the so-called acute arthritis of infants. Both these conditions are associated usually with extreme local tenderness, and with œdema extending beyond the joint. The "acute arthritis of infants," as you know, is not necessarily limited to one joint; it may be a polyarthritis, and in its early stages may easily be confused with rheumatism, but usually the general illness is much more severe, and the local symptoms altogether more intense than in rheumatism, and the occurrence of œdema and of suppuration in one

or more of the affected joints generally speedily settles the diagnosis.

Another condition which I have seen cause difficulty of diagnosis is gonorrhœal arthritis. Although it is not common, cases have occurred repeatedly in infants with ophthalmia neonatorum. You are aware that the pus from the conjunctiva in these cases shows an almost pure growth of gonococci, and I may remind you that the vaginal discharge which is so common in hospital children, often, if not usually, contains true gonococci. One would expect, therefore, to see gonorrhœal arthritis not only in infants but also in older children. A girl aged two years and eleven months was admitted under the care of Dr. Lees last year with this history:—Four weeks before admission a profuse purulent discharge appeared from the vagina. About a fortnight later one hand became swollen and painful, and three days after this the other was affected. The hands showed swelling, not limited strictly to the wrist, but extending over the dorsum of the hand and upwards slightly on to the forearm. The vaginal discharge was treated, and the tenderness of the hands disappeared quickly, but the swelling remained for some weeks. Without a bacteriological examination one cannot be certain, but it seems most probable that this was a case of gonorrhœal arthritis.

Another disease which occasionally simulates rheumatism in infants is infantile paralysis. Dr. Barlow drew attention to this point some years ago. I recall a case in an older child, in whom it began with stiffness of the neck, tenderness and pain about the shoulders, and some rise of temperature, suggesting at first the possibility of rheumatism.

It must not be forgottten that rheumatism, although it usually flies from joint to joint, may remain for some days limited to a single joint. This monarticular rheumatism is apt to be very puzzling in children. I have seen it affecting only the hip-joint; in such a case it may be almost impossible at first to diagnose from early tubercular disease; usually, however, as I have said, other symptoms of rheumatism will aid the diagnosis, and in any case the subsequent course and the reaction to salicylates will settle the question. The tendency to affection of the hip-joint in the rheumatism of childhood is striking, and has given rise to curious errors of diagnosis. One child was

sent here for perityphlitis, another for intussusception; in both cases the diagnosis was due to tenderness referred by the child to the right iliac fossa. Subsequent events showed that in each case the whole trouble was rheumatism of the right hip-joint.

We have had one or two chidren here with redness and swelling of the metatarso-phalangeal joint of the great toe only. Remember that gout does not enjoy the monopoly of the great toe; the swelling may be rheumatic, as it was in the children to whom I refer. At the same time, however, do not forget that gouty arthritis does occur, though with extreme rarity, in childhood. I have never seen a case of it, but it has been recorded by Sir Alfred Garrod at the age of seven years.

Another condition which though rare in children must not be forgotten, is hysteria. I have seen undoubted and severe hysteria which began at the age of four and a half years, and twice at least I have seen it simulate rheumatism in children under the age of twelve years.

So far I have spoken only of acute rheumatism, but there is another much less common form of rheumatism which, as I have elsewhere* pointed out, occurs occasionally in children, I mean chronic fibrous rheumatism.

This condition is distinguished from acute rheumatism by the chronicity and sometimes permanency of the articular affection, and also by the remarkable character of the change in the joints, which are not merely enlarged by effusion, but show definite fibrous thickening, which is partly in the capsule of the joint and partly in the neighbouring tendon sheaths; in other words, the inflammatory process has extended outwards to the surrounding structures and produced adhesions and thickening, so that the joint remains permanently enlarged and more or less fixed.

The diagnosis of this condition depends partly on the curious firm fibrous thickening about the joints, which suggests to the touch extra-articular fibrosis, and partly on the definite evidence of true rheumatism that usually accompanies it, namely endocarditis, subcutaneous nodules, and other well-known rheumatic manifestations.

The diseases with which chronic fibrous rheumatism is most likely to be confused are "rheuma-

* 'Med.-Chir. Trans.,' vol. lxxx.

toid arthritis" and the condition which I shall next describe.

Jaccoud described the condition "rheumatisme chronique fibreux" as occurring after repeated attacks of rheumatic fever in adults, and this seems to be the sequence in some of the cases in childhood, but certainly not in all, for without any preceding acute attack there may be a slow thickening of joints with increasing stiffness, accompanied by the appearance of endocarditis and sometimes of nodules.

So much for the two forms of articular rheumatism which are seen in childhood. We now come to a much more ill-defined group, the group which is known under the name of "rheumatoid arthritis." I have seen, I think, twenty-five cases of this condition in children, so that it is not so exceedingly rare as one might think.

How many varieties of arthritis are included under this too-comprehensive name one cannot tell; but it is, I think, certain that at least two, perhaps more, forms of arthritis are thus described.

I have attempted to differentiate two forms which are seen in children, and the first of these will perhaps be best described by the series of casts and pictures which I now show you. It is a progressive polyarthritis which begins usually before the second dentition, and affects almost every joint in the body, producing effusion into the joint cavity and thickening of the capsule, together with certain changes in the cartilage; it is associated, moreover, with enlargement of glands and usually with enlargement of spleen. The joints, especially those of the hand, show fusiform thickening; there is no osteophytic change, no lipping, and no thickening of bone. The onset of this disease is often acute, so that it is almost always mistaken for rheumatism at first; and, indeed, in the earliest stage the differential diagnosis may be impossible. Unlike rheumatism, this disease usually begins within the first three years of life, seldom later than the sixth year; I have known it begin at the fifteenth month. So far as I know, it is never associated with endocarditis, a fact the more remarkable as in all the four autopsies which have been made the pericardium was totally adherent. I should like to lay some stress on this point, for it shows a very striking difference from rheumatism; for post-mortem evidence, if one may judge from the records of thirty-eight years at

this hospital, shows that in rheumatism, in child-hood at any rate, pericarditis or adherent peri-cardium is never found without endocarditis. Subcutaneous nodules are not found in this pro-gressive polyarthritis, and there is no tendency to chorea.

The condition is quite unlike a tubercular disease; there is no tendency to caseation of bones nor to tuberculosis elsewhere, and post-mortem examinations have conclusively proved that this disease is not tubercular.

The second division of this vague group of "rheumatoid arthritis" is one which resembles in all points the rheumatoid arthritis of adult life. The child shows slow enlargement and stiffness of several joints, and subsequently osteophytic changes occur with lipping of bone as in adults. There is no enlargement of glands and no enlargement of spleen; and a further difference from the previous form is found in the fact that this form of the disease usually begins after the age of six years. The diagnosis of this form from chronic fibrous rheumatism depends in the early stages chiefly on the absence of rheu-matic complications; subsequently the presence of bony grating or of bony enlargement may settle the diagnosis. From tubercular disease it is dis-tinguished usually by the symmetry of the affection and the number of joints involved, together with the absence of other evidence of tubercle and the extremely chronic course.

I have spoken very briefly of this extremely in-teresting group of so-called rheumatoid arthritis, because I want now to speak of another variety of arthritis in childhood, which is liable to be confused with rheumatism. I refer to the group which for want of a better name I shall call " septic arthritis."

Septic arthritis may conveniently be divided into two classes: 1. Arthritis with specific fevers; 2. Arthritis with a primary focus of infection.

This of course is merely a clinical classification; in their pathology and bacteriology the two classes overlap.

1. *Arthritis with Specific Fevers.*

Scarlet fever. You are all familiar with so-called "scarlatinal rheumatism" and its minute differences from rheumatism proper. I shall say nothing about it, except to warn you with the fervour of

sad experience never to forget the possibility of scarlet fever when you are called to see a child with a first attack of rheumatism. I need hardly remind you that the arthritis which follows scarlet fever is not always a transient affair. A little girl aged three years was sent here for "rheumatic fever." The history was severe sore throat seven days before, followed after five days by extremely tender swelling of the left elbow and right knee. The child had been delirious. The joints were swollen and red, and there was marked œdema over them. The case was admitted under Mr. Morgan's care, and pus was evacuated from the joints. The child died after suppuration in several joints. In such a case, apart from desquamation and subsequent nephritis, the extreme constitu-tional disturbance, the exquisite tenderness of the joints, and the presence of œdema over them, are the determining points against rheumatism.

Diphtheria also occasionally gives rise to an arthritis which may or may not be suppurative, and I should like to call your attention to the very suggestive fact that the arthritis which follows diphtheria and scarlet fever seems to be most common after severe faucial affection. It is re-markable also how frequently one hears that a child developed articular rheumatism immediately after a sore throat. In the case of scarlet fever and diphtheria the sequence can hardly be con-sidered accidental. And one cannot help thinking that in some cases, at any rate, of rheumatism also the fauces may afford an entry to the virus.

Measles is occasionally, but rarely, followed by arthritis. In some of the cases, however, perhaps in most of them, there is some severe lung compli-cation as well, and, as I shall point out later, this may be the source of the arthritis.

Typhoid I have known to cause considerable difficulty in diagnosis. Occasionally quite early in typhoid there occurs in children an arthritis which is transient and quite indistinguishable from rheu-matism. On the other hand, I have seen articular rheumatism in a child with a temperature chart that might well have been that of typhoid. You are familiar with the suppurative arthritis which occurs later in typhoid.

Influenza, again, gives rise to a septic arthritis. About three years ago there was under Dr. Barlow a boy aged one year and nine months, in whom arthritis occurred in several joints with a definite

attack of influenza (the whole family were suffering from influenza at the time). Most of the joints recovered completely, but a little thickening and stiffness were left in the right wrist and the left knee. In this case the septic nature of the arthritis was further proved by the simultaneous appearance of a septic inflammation in the eyes, resulting in a pseudo-gliomatous condition in one eye.

Erysipelas seemed to be the origin of a similar condition in a child aged five and three quarter years, under Dr. Lees; and you are aware that mumps is occasionally followed by a similar septic arthritis.

2. *Arthritis with a Primary Focus of Infection.*

In this group the arthritis has its origin in some definite localised source of infection. A severe otitis media may be the starting-point; some of you have seen such a case at present in the wards. An empyema seems to be the source of arthritis in some cases. Not long ago a little boy aged two and a half years was in Dr. Penrose's ward with an empyema, which followed immediately after measles, and was associated with an acute arthritis resulting in suppuration in one hip-joint. In such a case it is difficult to be sure whether the measles or the empyema is to be regarded as the immediate source of the arthritis; at any rate it is noteworthy that in other recorded cases of arthritis following measles there has also been some pleural or lung complication.

It is, of course, well known that septic processes in the lung may be associated with an arthritis which may be quite transient. I have known children with bronchiectasis develop quite suddenly a little fulness, tenderness, and stiffness about one or more joints, which, however, in a few days had recovered completely.

In septic arthritis due to any of the causes I have mentioned, the joint affection may be quite a transient affair, such as I have just described; or there may be permanent thickening and adhesions of the joint with any degree of fixation up to almost complete fibrous ankylosis; or there may be suppuration and complete disorganisation of the joint. But one feature is characteristic of the whole group of septic arthritis—that the affection is, so to speak, "a sudden flare-up," which, although it may last weeks or even months, seems

to "burn itself out," and leaves only its traces behind; it is not *per se* a progressive condition.

This fact, together with the history, will usually enable you to diagnose septic arthritis from the rheumatoid arthritis group, and I might add that in these cases of septic arthritis the limitation of movement is often altogether out of proportion to the apparent alteration of the joint, whereas usually in chronic fibrous rheumatism and the two varieties of so-called rheumatoid arthritis which have mentioned, much limitation of movement is associated with much enlargement of joints.

Before leaving the subject of septic arthritis, I should like to mention a curious swelling of joints which occurs in infants with a particular form of meningitis.

In the disease known as the "posterior basic meningitis of infants" there occurs sometimes a swelling about one or more joints which at first sight one would say was obviously due to arthritis. But if you cut down on the joint, as has been done more than once, with the idea that it was an acute septic arthritis, you find that the joint itself is perfectly healthy; the lesion consists of a lymph-like exudation about the tendon sheaths in the neighbourhood of the joint, and round the capsule of the joint.

Until recently the nature of the affection was unknown, but it has now been shown[*] conclusively that it is due to a local infection by the same micro-organism which produces the meningitis, namely, the diplococcus of posterior basic meningitis.

I should like to have said something about syphilitic affections of joints in children, but time will only allow me to refer to them briefly.

Now and then one sees a subacute effusion into one or more joints in a child with definite evidence of syphilis, a painless condition as a rule, and limited usually to one joint or to two symmetrical joints. Twice I have seen a condition very like Heberden's nodes in children, with congenital syphilis, and in one boy aged six years congenital syphilis was associated with a condition very like the rheumatoid arthritis of adult life, with marked bony thickening and lipping about the joints. All these conditions are usually of gradual onset, and one is hardly likely to confuse them with rheumatism. The absence of other rheumatic manifestations, the evidence of congenital syphilis, and

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[*] ' Journ. Path. and Bacteriol.,' 1898.

sometimes, as in the case I show you, the presence of a gumma or interstitial keratitis, may assist the diagnosis. Acute epiphysitis in syphilitic infants may, as I have said, simulate rheumatism.

Tubercular arthritis should have been mentioned, but I have left it till last as it is more familiar than some of the diseases I have referred to. The diagnosis from any of the above conditions may be difficult at the onset, but the limitation usually to one or possibly two joints, the characteristic "pulpy" feeling of the joint, the evidence in some cases of tuberculosis elsewhere, and the course of the disease, will generally suffice for diagnosis.

In conclusion, gentlemen, I have to thank those members of the staff who have allowed me to make use of cases in their wards. I hope that although I have only been able to deal with the subject very briefly, I have said enough to show you that the diagnosis of the various forms of arthritis which occur in childhood is by no means a simple matter, and that swelling of the joints in children is not necessarily either rheumatic or tubercular.

NOTE ON A CASE OF SUBMENTAL TUMOUR.

By J. G. TURNER, F.R.C.S.

A PATIENT, æt. 65, came under my notice at St. Saviour's Hospital, Osnaburgh Street, who had had, as long as she could remember, certainly since the age of six, a submental swelling. During the last six months this had rapidly increased in size, and had lately become painful, though up to then it had not troubled her. She had been wearing lately a clawed brooch, which she thought had irritated it. There was beneath the chin in the middle line a swelling about the size of a Tangerine orange, over which redness, œdema, and tenderness were well marked, while fluctuation was perceptible but not very obvious. Examined from the mouth it did not push up the floor, nor interfere with the movements of the tongue; there was no inflammatory thickening of the floor, nor was fluctuation felt between fingers inside the mouth and outside on the tumour. The diagnosis lay between cystic and glandular swelling, and this was decided by the condition of the teeth of the lower jaw; for though there were several "dead"

teeth, that is, teeth in which, from progress of caries, the pulp had become exposed, died, and putrefied, which were quite competent to give rise to glandular enlargement, yet they were neither tender nor painful, nor had been so recently (and this point must be attended to, especially in weakly subjects, since the glandular trouble may persist and go on to suppuration after all inflammation round the offending tooth has subsided); together with the fact that there was no thickening of the floor of the mouth, for a suppurating gland would cause inflammatory thickening of all parts round it. Hence the tumour was thought cystic, and of congenital origin, from its early appearance and the absence of any black stigma such as a sebaceous cyst presents at its blocked orifice. Since there was inflammation, adhesion to skin went for nothing. But it had yet to be explained why it had so rapidly increased, and why there was suppuration on one side only. At the operation an explanation suggested itself—on incising in the middle line some pus escaped, and was followed by pultaceous matter, which, after the first portion had escaped, came away as if squeezed through a hole, in spite of a free external opening; by pressure from the mouth and sides of the neck considerable quantities of this pultaceous matter were evacuated, which could be seen issuing from a hole between the anterior bellies of the two digastrics, and from a pocket under the right digastric. A probe passed about one inch along this pocket, and through the central hole could be felt in the floor of the mouth, but did not reach into the base of the tongue; no other pocket could be found. On looking for the cyst wall this was readily found, and twisted away in the central part between the digastrics, but nowhere else. A section of this showed epithelium several layers deep. Hence it seems probable that the tumour was a central inclusion dermoid, which had been irritated and inflamed, perhaps by the brooch, and that the rapid enlargement was due to the escape of the cyst contents and to inflammation consequent thereon; the continued presence of the foreign body and the external irritation ultimately leading to suppuration on the one side only. The pocket along the right digastric was probably formed by the extravasated contents. After operation, iodoform emulsion in glycerine was rubbed in, and a gauze drain inserted. In ten days the wound had healed without any suppuration.

NOTES, ETC.

Primary Pleural Carcinoma.—Benda ('Deut. med. Woch.,' No. 21, 1897) reports an instance of this rare affection. The patient died from pyæmia after a surgical effort to remove a lung tumour. On the surface of the pleural tumours the arrangement was papillary in character, as in ovarian papillomata, covered with cylindrical epithelium, and the stoma was rich in vessels. Deep in the tumour the disposition of the cells was in alveoli and in rows; they were cubical, flattened by pressure, or arranged in glandular form, no lumen being visible. Small cysts were here and there visible. The tumour grew from the upper layers of the pleura and above its elastic layer, one slide showing the exact demarcation of the younger growths from the pleura proper. In some places the elastic tissue was perforated, but the growth never reached the lung substance. Benda calls especial attention to the fact that the glandular cell-rows could be followed accurately to the pleural epithelium, and that the cylindrical cells of the excrescences passed gradually over into the flat pleural cells. Epithelial growths, according to Thiersch and Waldeyer, can scarcely develop from endothelial surfaces. E. Wagner, and after him Schulz, Bostroem, Neelsen, Fraenkel, &c., hold that carcinoma can spring from epithelial cells, although his doctrine teaches that endothelium and epithelium are distinct. Benda calls attention to the fact that the peritoneum of woman is directly continuous and consecutive with the epithelium of the tubes. The Hertwig brothers have shown that the mesoblast produces the epithelium of the pleuro-peritoneal cavity. Hence we abandon the term endothelium in connection with this double cavity, and speak of epithelium. While Orth, then later Ziegler, Seeliger, and Hansemann have written on the subject, Benda asserts he is the first to prove the origin of such a tumour from the so-called pleural endothelium. The tumour resembled in certain respects cutaneous, vesical, and ovarian carcinoma. Benda does not contest the entire statement of Wagner that tumours originating from the pleura are like those springing from lymphatic vessels. Benda's case is peculiar, first in having such an obviously broad and apparently simultaneous primary growth from the pleura; second, in not growing into the lung; and third, in having no metastases.—*Medicine*, March, 1898.

The Diagnosis of Ascaris Lumbricoides.—Muller de la Fuente ('Munch. med. Wochenschr.,' 1897, xliv, 739) writes that the general practitioner, as a rule, attempts to make the diagnosis of ascarides without a microscopical examination of the fæces. The first symptom to make its appearance generally is the occurrence of sudden acute abdominal pains. The history then shows that slight pains have been experienced before, but which, being transient, were not complained of; or we may elicit, where we are dealing with an infant, that it had lately been restless, crying a great deal, refusing nourishment, &c., which condition had, however, passed off within a few hours or a day. These pains are characterised by the difficulty experienced in their exact localisation, and it is not rare to find a more or less tender point on pressure over the region designated by the patient. Very young children, who permit the palpation of the whole abdomen without resistance, suddenly start and cry when a certain point is touched, and this is repeated whenever this portion is reached in palpation. The differential diagnosis between inflammatory processes is established by the absence of high fever. A slight rise of temperature, it is true, may occur towards evening, but during the day the patients present a perfectly normal temperature. In exceptionally bad cases the pain is so great that older children moan and cry out. Movements of the bowels are always present; either there is a diarrhœa, or, quite as frequently, the passages are perfectly normal, this being a valuable diagnostic sign. Convulsions have been observed by the author, due to the presence of ascarides. The sudden, nearly epidemic appearance at times, of ascarides in certain localities presents a peculiar phenomenon.

Exceedingly remarkable is the enormous contraction of the field of vision in cases where intestinal parasites are present. In some cases this may be demonstrated by a very superficial examination.

Pediatrics, March, 1898.

Differential Diagnosis between Appendicitis and Intestinal Obstruction from Gallstones.—Th. Kölliker ('Central. für Chirurgie')

relates a case of obstruction from gall-stone presenting diagnostic difficulty, and much resembling a case of appendicitis described by Sonnenberg in his work upon perityphlitis. The history as given is briefly as follows :

Woman 58 years of age, without previous history of gall-stone colic, but having had a few months previously an attack of appendicitis, was suddenly taken ill with constipation three days previous to his first observation, followed in twenty-four hours by fæcal vomiting; a tumour could be felt in the ileo-cæcal region. Various diagnoses were made by observers, one being compression of the bowel from an old perityphlitic exudate, another being obstruction due to disease of the uterine appendages of the right side. There were no symptoms of the trouble in the biliary passages. The author concluded that the case was one of compression of the bowel by a perityphlitic exudate. The peritoneal cavity was opened in the middle line. The right half of the cavity was filled with distended bowels, and from the left distended coils of small intestine pressed forward. Presently a hard body, filling the lumen of the bowel, was discovered. The bowel was opened on its convex surface, and a gall-stone, four centimetres by three centimetres, was extracted. The mucous membrane of the intestine was closely attached to the stone, and ulcerated in the superficial surface. The wound was closed and recovery ensued, the first stool occurring twenty-four hours after operation.

For comparison, Sonnenberg's case was narrated, and exhibited the following symptoms. The case was that of a fifty-year-old patient who had had several attacks of perityphlitis, and in recent times a resistance in the ileo-cæcal region, with acute symptoms, and obstruction appeared. Fever was absent. After opening of the peritoneal cavity there was revealed a chronically inflamed and moderately adherent appendix, which seemed scarcely sufficient cause for new developments, especially as the previous resistance in this region had disappeared. After a search a goodly sized gall-stone was discovered lying in one of the coils of the intestine. The patient died in collapse, with reappearance of the obstruction before death. At the autopsy a second stone was found wedged in the duodenum, another one in an ulcerated point of communication between the gall-bladder and the duodenum, and a fourth in the gall-

bladder. The coils from which the gall-stone had been removed were in part gangrenous.

The writer concluded that some cases are most difficult to diagnosticate before opening the abdomen, but that the greater movability of the tumour and the acute onset without fever are suggestive of gall-stone obstruction.

Buffalo Medical Journal, February, 1898.

X Ray Burn ; Amputation of the Thigh.—

Dr. J. P. Tuttle reported a case in which amputation of the thigh had been demanded after an X ray burn. The man had been injured in war. Dr. Tuttle and Dr. McBurney had together removed a floating cartilage from the knee-joint about four years ago, and, although the operation had been largely an experimental one, it had given the man relief from pain for three years. His sufferings had then returned. Accordingly, last September, the joint had been examined with the X rays, the examination lasting over one hour. There was no pain at the time, but three weeks afterward the parts began to turn red, and in two days all of the skin about the joint, except on the posterior and internal surfaces, sloughed away. Portions of the surface healed and again broke down. Then skin was transplanted from two different individuals, and the first attempts in this direction proved so successful that the remainder of the surface was covered over in like manner. But at the end of five weeks both of these areas of skin-grafting broke down. When the man came under Dr. Tuttle's observation three weeks ago, an area measuring $6\frac{1}{2}$ by $5\frac{1}{2}$ inches presented the typical features of an X ray burn. In consultation with Dr. E. B. Bronson and Dr. V. P. Gibney, it was decided to try the effect of constant irrigation with carbolic acid solution. Only for the first two or three days did this seem to act well; then the surface became more unhealthy. As the man's health was failing rapidly, and he was becoming addicted to morphine, a consultation was held, and it was decided that the limb should be amputated. This was done on February 8th, and so far the patient had done well. The specimen was interesting as showing that the pathological condition found in the burned area extended down even to the capsular ligament.

Dr. E. B. Bronson said he thought the term X ray burn a misnomer, for the whole history of these

cases pointed to a process entirely different from a burn. Instead of beginning from without it began within, and was reflected to the skin. The fact that these injuries did not make their appearance immediately after the exposure to the X rays seemed to show that the condition was not comparable to an ordinary burn. Often two or three weeks elapsed before there was the slightest reaction. Sooner or later in these cases of so-called X ray burn a gangrenous process made its appearance, and was the outward manifestation of some inward process, probably connected with the nervous system. This gangrenous process was peculiar in that the slough looked like chamois leather, and that it was associated with intense capillary congestion of the papillary layer. The specimen presented was an excellent exemplification of the statement that this process was by no means confined to the skin. In connection with the management of these very trying cases it was interesting to recall the fact that Dr. Seneca D. Powell claimed to have achieved better success from excision of the skin in the affected area than by the usual methods.

Dr. William Vissman said that sections from the centre of the specimen presented showed a mass of connective tissue, with the walls of the blood-vessels infiltrated with round cells. This extended up on to the intima of the popliteal artery. There seemed to be a gangrenous process, possibly due to an arteritis of some of the smaller blood-vessels. He had not yet had an opportunity to examine the whole specimen thoroughly. Whatever the process that had existed in the bone, it seemed to have passed from within outward.

Dr. V. P. Gibney said that he had known this patient for many years, and from an experience with one case of X ray burn, which had healed only after eighteen months, he had felt satisfied that the only thing to do for this man was to amputate.

Dr. van Arsdale asked if there was anything in the statement that had been made, that coating the part with vaseline before exposing it to the X rays would prevent such unfortunate consequences.

Dr. J. P. Tuttle said it had been stated that no such X ray burn had been caused when the static machine had been used to generate the X rays. It was worthy of note that in his patient the applica-

tions which ordinarily relieve the pain of burns seemed only to aggravate the man's sufferings. It had been suggested that thin pieces of aluminum should be placed over the part to guard against these burns.

Very few of these injuries healed in less than nine months. Dr. Powell had told him that he had cut out several of these, and they had healed in six or eight weeks. Apostoli had tried this method of dissection in his case. It had healed up, but broke down again subsequently. Dr. Tuttle said that he knew personally of three of these cases. One occurring eighteen months ago was now getting well ; one of twelve months' standing had only been slightly reduced in size by grafting and all sorts of treatment ; the third one occurred six months ago, and was now in practically the same condition as at first.

Medical Record, March 5th, 1898.

Disturbances in the Digestion caused by Hernia.—By Kuttnar ('Mitth. A. D. Grenzbieten Der. Med. U. Chir.,' No. 5). This author refers to the colic, vomiting, and permanent pain, with eructations, nausea, loss of appetite, accompanied by the vomiting which is often found in hernia of the linea alba. These symptoms are not referred to in many works upon affections of the digestive apparatus, and are mistaken for gastric neuroses by many physicians. The phenomena are the same, whether caused by subperitoneal ligament pulling on the peritoneum, or by an actual hernia, consisting usually of omentum. The operation that cures the · hernia abolishes the digestive disturbances.—*The Post Graduate*, March, 1898.

MILK WINE is a peptonised product of milk made by The Milk Wine Co., London ; it is a perfectly clear and brilliant wine, having the appearance of pale sherry. The preparation has great medical value, both for use in the sick room, and also for convalescents. This value consists in the fact that the casein contained in the original milk is present in the wine in the form of peptones, which are capable of absorption without digestive effort. The preparation is therefore a highly peptonised milk possessing very valuable properties, and taking the form of a thoroughly sound and palatable wine.

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NOTICE.

A DEMONSTRATION OF CASES OF SKIN DISEASE.

Given at the Charing Cross Hospital, February 3rd, 1898,

BY

JAMES GALLOWAY, M.D., F.R.C.P.,

Physician to the Skin Department and Joint Lecturer on
Practical Medicine, and Medical Tutor at the Hospital.

LICHEN PLANUS.

THE first case I wish to show you this afternoon
is a young woman who shows very typically an
attack of lichen planus of slight degree. When
the majority of cases of lichen planus present
themselves for treatment, the distribution of the
eruption may be on the trunk, forearms, and legs;
and as the condition is easily recognised, there is
little likelihood of a wrong diagnosis. But there
are two forms in which lichen planus comes
before us, in which the difficulty of recognition
becomes somewhat greater. The first form you
will see presently; the second form is the acute
generalised lichen planus, in which the eruption
occurs practically over the whole body simul-
taneously with a great deal of erythema and irri-
tation, and sometimes accompanied by some rise
in temperature. These cases are somewhat rare,
but the fact that they do occur should be borne in
mind, for by doing so errors in diagnosis may some-
times be avoided. The patient in the next room,
on the other hand, has one or two spots on the
body, where the papules of lichen planus have
run together in groups, producing an appearance
which is quite verrucose, and which goes by
the name lichen planus verrucosus. When you
see these lesions the condition is quite readily
recognised. But I want you to notice especially
that on other parts of the body and on the front of
the forearms there are exceedingly small flat
shining papules of lichen planus which would be
very easily overlooked if your attention were not
specially directed to them, and which are equally
characteristic of the disease. A curious point arises
in reference to the symptomatology of the disease

in these slight cases, namely, that frequently the slight cases of lichen planus are those in which a great amount of irritation and itching takes place. The amount of itching and irritation is not commensurate with the intensity of the disease at all. I saw the other day a case of the acute generalised variety, in which there was scarcely a patch in the body from head to foot which was not covered with an acute eruption, and yet there were practically no signs of irritation or itching whatsoever. The young lady in the other room complains very much of itching and irritation.

You will notice that the papules are firm and dry ; there is never any moistening of the surface, nor tendency to the formation of lesions of true eczematoid character. The papules at the periphery of any patch have a peculiar angular character instead of the rounded character which is the usual type of papule in certain cases of lichen pilaris. I want you especially to notice these scale-like patches on the forearms, as their early recognition will help you in your diagnosis.

In reference to treatment, I should like to draw your attention to the fact that in lichen planus the itching and irritation is really the only symptom that you are called upon to treat. At present we know of nothing, except perhaps the administration of small doses of perchloride of mercury, which has any influence in checking the course of the disease. From recent observations it appears that small doses of corrosive sublimate, especially by means of hypodermic injection, have some effect in arresting its course. The treatment which should be recommended in cases of this kind is by the inunction of an ointment containing half to two or three grains of perchloride of mercury as the principal constituent, and in addition to that carbolic acid or salicylic acid, or both. The carbolic acid especially is indicated when the irritation is very excessive ; if there is very much tendency to scaliness, salicylic acid would be added. In cases where the lichen planus tends to pass into the verrucose type, and is accompanied by a great deal of desquamation, the perchloride of mercury should be given in the larger amounts. Obviously in using preparations of this kind one has to watch the patient carefully to see that no symptoms of mercurialism are developed. Short of those symptoms the absorption of the mercury does good rather than harm.

This patient is having the inunction of a salve containing perchloride of mercury ½ grain, 10 min. of carbolic acid, and 10 grains salicylic acid to the ounce of a base such as vaseline. This rubbed into the spots allays the itching, and usually produces a favourable result in the disease. There is one other point in the treatment I specially want to emphasise, namely, that in cases of lichen planus unless you are prepared to push arsenic to a very great degree, and even then it is of doubtful efficacy, never commence it. Small doses of arsenic in lichen planus are useless. The drug may produce disfiguring pigmentation, and cause keratosis of the palms and soles of the feet. Some of the severest cases we see of pigmentation remaining on the skin are after this misdirected treatment of lichen planus.

DIAGNOSIS OF CERTAIN SYPHILIDES AND TUBERCULOSIS.

The next patient has illustrated very strikingly a difficult point in diagnosis, though now the diagnosis is not so difficult as it was. The case is an example of the difficulty of distinguishing between certain forms of chronic syphilis and tuberculosis. This woman, aged about 40 years, came to the hospital three months ago, the diagnosis of lupus vulgaris having been made. I may tell you that at that time the whole of the face was occupied by an eruption such as you see now in the central portion of the face only,—that is to say, there was a densely infiltrated eruption all over the cheeks and face and forehead, and patches on neighbouring parts of the neck also. A good deal of deformity, as you can imagine, was produced ; the tip of the nose had vanished, and I believe certain operative measures had been undertaken with the idea of disposing of this tubercular tissue, as it was thought to be. When she came to me I was not at all certain of the diagnosis in spite of the suggestion which had been made. First of all, the disease had commenced eight years previously, and had taken that time to reach its present degree of intensity. I noticed also that in addition to the generalised eruption on the face, there were certain outlying patches of infiltration, of which you can still see one on the neck. The infiltration was peculiarly uniform in density. From these considerations, and from the actual appearance of the lesions themselves, I felt inclined

to think that the case was not one of tuberculosis, but of syphilitic disease. Fortunately, before suggesting any operative measures, which had been seriously thought of, I decided to try whether syphilis had not been concerned in the production of the disease, and I commenced treating . her by the administration of iodide of potassium, alternating that drug with corrosive sublimate. No sooher had she begun taking these remedies than the infiltration began to vanish away from the sides of the neck, leaving a parchment-like scar, which is so suggestive of syphilitic disease. When she came to me the whole cheek was thickly infiltrated with granulo-matous lesions it looked very like lupus vulgaris, and now there is only a slight amount of scarring to be seen, so you will be able to judge of the improvement which has taken place. There are at least two classes of the lesions produced by syphilis which one ought particularly to bear in mind with a view of distinguishing them from those of tuberculous disease. The first is the chronic late syphilide of this type ; and the second is the same type of syphilide occurring in children who are the subjects of congenital syphilis. Since I have had this department under my care I have seen four or five examples of syphilides of this type treated by scraping, skin grafting, and other recognised measures for the treatment of lupus without success, which were really cases of syphilis, and which healed and got perfectly well by inunction and intra-muscular injections of mercury. The points one ought to bear in mind in distinguishing these lesions are—(1) the infiltra-tion which occurs in these late syphilides is usually not nearly so dense as that which occurs in tuber-culosis ; (2) these late syphilides which simulate tuberculosis are *usually* more numerous than the tubercular lesions. For instance, in a child with congenital syphilis, who has developed an eruption like that of lupus, one will find that perhaps three, or four, or five, or even more patches of skin over the whole body may be involved. As you observe in this case, not only was the face affected, but there were one or two patches outlying in the neck which had a similar infiltration. The presence of these was one of the points which made me suspect that the lesions were caused by syphilis, and not by tuberculosis. The improvement which has taken place in her case is the result of three

months' antisyphilitic treatment. I should have liked to show you a case of congenital syphilis at present under my care to compare with this. There was an eruption simulating tuberculosis; one patch on the inside of the knee, and another on the inside of the opposite thigh. Both had been scraped, one had been skin-grafted, and there was a good deal of difficulty in the diagnosis. But the child has been treated by antisyphilitic measures, and is now well, after six or eight years of treatment under a mistaken diagnosis. The results of treatment on wrong lines may be severe, as in the patient before you.

PITYRIASIS ROSEA ?

For an account of this case you will have to depend upon me to a certain extent, because she is now improving, and the lesions which were distinct at the commencement are no longer so. She is a child aged ten or twelve, who was sent to the hospital by Mr. Lockyer, our surgical registrar, suffering from an acute, circinate eruption over the lower part of the abdomen, the upper part of the thighs, and the region of the genitals. The eruption was very red, markedly circinate—in fact, almost circular, and here and there was noticed one ring inside another,—that is to say, the ring seemed to spread at the margins, and then a new point of redness would start in the centre and spread in the same way. The question of dia-gnosis was the difficult one in this case, as well as that of treatment. I felt inclined to think that the case was one of that rather rare form of skin dis-ease called *pityriasis rosea*. The disease runs a definite course, varying from about six weeks to three or four months, producing on the trunk red circinate spots, very superficial in character, usually accompanied by irritation, rise of tempe-rature, and a slight feeling of illness. If you see a typical case of pityriasis rosea you are not likely to mistake it for anything else. But there are certain forms of the disease which closely re-semble dermatitis seborrhœica. The importance of distinguishing it is, that when you have come to the opinion that it is pityriasis rosea you must avoid treating your patient vigorously. If it is dermatitis seborrhœica you have to use vigorous measures of treatment to get rid of the infective process. Treatment of pityriasis rosea as if it were dermat'tis seborrhœica might produce consider-

able irritation of the skin. Another point I wish to mention is that you will observe this case of pityriasis rosea apparently did not spread to any extent over the trunk, but remained almost limited to the lower part of the abdomen and the region of the genitals. That is unusual in pityriasis rosea, as it usually extends over the whole trunk. There is a somewhat mysterious skin disease which has this peculiar feature, of which only a very few cases have been described, and which is not yet quite identified. This disease, which attacks the neighbourhood of the genitals in children, is evidently contagious in some way, and produces circinate and circular eruptions over the neighbouring skin. Dr. Colcott Fox has drawn attention to this peculiar affection specially, and it is just possible that the child is affected by this curious complaint. I should say that if you make the diagnosis of pityriasis rosea the patient need only have ordinary baths, or perhaps bran baths, which soothe irritation, but no strong antiseptics should be used.

Dermatitis Exfoliativa following Psoriasis.

The next patient is a man whom I have had to take into the hospital on account of the severity of the inflammation of his skin. I wish you to recognise in him one of the forms of general exfoliative dermatitis, a disease which is often accompanied by a considerable amount of cachexia and weakness in the patient. Probably several conditions tend to produce the disease. There is one form of it which is much more dangerous than others. Patients affected by it, without any warning, begin to suffer from intense erythema of the skin, followed by desquamation, which increases in degree until the epithelium is cast off in large flakes. Those cases are accompanied by a very considerable rise of temperature, often rigors, emaciation, and the result is not at all satisfactory. Those are the idiopathic cases of exfoliative dermatitis. The majority of the cases of the group of diseases which we recognise as general exfoliative dermatitis are really other skin diseases, which for some reason or other have become exaggerated, and are, so to say, caricatures of themselves. Often the disease which undergoes this change is psoriasis. This man before us has suffered from psoriasis for some time. Recently he has not been in a good condition of health, having lost

employment, and has not been well looked after. As he passed into this low condition of health the psoriasis spread all over the body, and produced the general dermatitis you can see. There is a good deal of loss of epithelium, but the scaliness has somewhat diminished since he has been taking bran baths. You can understand the very serious trouble which is caused by the skin being so densely infiltrated. He is covered over the whole body with the condition which you see on the exposed areas.

One of the causes of the production of this disease is *lowered vitality* in the subject of some other chronic inflammatory condition of the skin. I have seen cases of acute general exfoliative dermatitis of this kind coming on as a result of the development of acute tuberculosis during psoriasis. Here is a case in which acute general exfoliative dermatitis has commenced in a case of psoriasis, the result probably of mal-nutrition and want of proper care.

I wish to particularly emphasise *another cause*. We, as medical practitioners, unfortunately have very much to do with the second of these two causes, for it may result from the administration of mercury in patients suffering from certain skin diseases. Last year I saw a young man suffering from chancroids; the condition of the patient had been diagnosed as syphilitic, and he was accordingly vigorously treated by the inunction of mercury, and was also given the drug internally. He had for years suffered from slight chronic psoriasis. An intense mercurial erythema resulted, and following that came a sudden flash of exfoliative dermatitis all over the trunk, limbs, and head, and in a very short time the man was nearly dying—there was no salivation; fortunately, on stopping mercurial treatment he improved, and in three months he had nearly recovered. So that you see an error in treatment in such a case may have very serious consequences.

Lupus Erythematosus of the Type of Erythema Multiforme.

The next case is one of interest, but as the acuter portions of the eruption are beginning to disappear now, it may require a little description. When the patient—a woman aged about 36—was sent to the hospital we had no vacant beds, and she was so ill that I was nervous about allowing

her to go home, as she was really not fit for the journey. She suffered from severe bronchitis. There was great difficulty in respiration, rise of temperature, and certain of the symptoms suggested that there might be underlying pulmonary tuberculosis. In addition she had the most intense erythema of the face that I have ever seen, and it was symmetrically arranged. The erythema also occurred on the hands symmetrically, and to a less extent on the feet; the forearms were also affected, and other parts of the body slightly. It was present not only on the backs of the hands, but on the palmar surfaces also. On returning to her home in the north of London she got steadily worse, but after a time we managed to find room for her in the hospital. With rest and treatment the pulmonary complaint rapidly improved, but the erythematous eruptions have remained, although not in so acute degree. First of all I want you to notice the distribution of the erythema. It is symmetrically distributed on the face and extremities, and on the hands occupies areas on the backs of the phalanges as well as the finger tips, and patches on the palms. You will notice that on the erythematous areas the skin is showing signs of atrophy; there is little scaling, and the skin is not so firm as it is normally. On simply looking at the erythema and its distribution on the extremities, one would be justified in diagnosing that this was one of the peculiar forms of erythema multiforme, of the type called erythema iris. But you would at once have doubts of this diagnosis when the atrophy of the skin was noted. There can be no doubt that this patient is affected with *acute lupus erythematosus*, affecting not only the face but other parts of the body as well; a form which has been described as exanthematous lupus erythematosus, which is frequently a disease of great severity and great danger. This patient was seriously ill while the eruption was active. It must be recollected that lupus erythematosus is not a disease which is caused by the growth of the tubercle bacilli in the skin; that has been proved over and over again. There is a peculiar form of lupus vulgaris, in which erythema is symmetrical, as erythemata tend to be, in which tubercle bacilli are found, and which produces tuberculosis when inoculated into animals. That is often mistaken for lupus erythematosus. But remember that

lupus erythematosus is a disease in which erythema is the striking feature, and in which infiltration is slight and superficial, consequently great scarring or cicatrisation does not occur. The atrophy that occurs in these erythematous patches of lupus erythematosus is of slight degree, unless the disease is complicated by some other process. I am, therefore, led to remind you of the very ingenious hypothesis made by certain observers, which has undoubtedly a certain basis of fact, namely, that lupus erythematosus is really a disease of the erythematous group, allied to erythema multiforme, and is produced by similar causes, namely, by certain poisonous substances—toxins—circulating in the blood, which have the power of producing terminal vaso-motor paralysis, just as in some cases of erythema multiforme there can be but little doubt that toxins having this effect are absorbed from the alimentary tract. In lupus erythematosus the erythema is so intense that it produces slight atrophy of the skin; in erythema multiforme no atrophy of the skin occurs. Further, the suggestion has been advanced that in cases of lupus erythematosus, especially of this type, the toxins are absorbed from foci—latent or active—of tuberculosis. There is no doubt that there is some clinical evidence in favour of associating phthisis and lupus erythematosus; and it is said that tubercular lesions, such as caseating foci in the lungs, tubercular glands in the mediastinum, &c., are capable of giving rise to poisonous substances which, on absorption, affect the skin in the manner I have described. This patient has probably latent or chronic tubercular trouble in the lung, though no definite signs have been observed; and it is quite possible this case might be cited as an illustration of the theory I have quoted to you by its upholders, especially in Paris.

FACTITIOUS PURPURA.

Every one knows that urticaria is a condition in which the vessels are disturbed by some irritation. The ease with which factitious urticaria may be produced is an element in the diagnosis of certain urticarial conditions. I took this man into the wards some time ago on account of the fact that he had purpura, of which you see traces on his legs. He is the only case I know in which *factitious purpura* has been obtained—not factitious urticaria—by artificially stimulating the skin. The

purpura became worse in the wards, and it was noticed that if we stimulated the skin of the legs very slightly, there occurred around the track of the stimulation first of all a slight wheal, such as in factitious urticaria, but that in a short time the wheal became full of blood. I drew my finger-nail over his skin two hours ago, thinking perhaps this artificial purpura would be manifest to you now, but his condition is very much improved, and the result I hoped has not occurred. Facti-tious purpura may possibly be more common than is supposed. He is wearing elastic stockings, which have had an excellent controlling effect upon the purpuric condition of the lower ex-

now much smaller than formerly. At certain sea-sons in the year, both in summer and winter, she develops little patches of distinct firmness and in-filtration of the cutis of the hands. There is observed first of all a small patch of erythema, the central part of which becomes infiltrated. The infiltrated parts of these erythematous areas ne-crose, so that each leaves a scar, and you will see that her hands are marked by such scars. I wish you to recognise the case as a rare form of skin disease ; and in the second instance I want you to recognise it as a form which is probably allied in some way to the tubercular process. It is found clinically in those patients who have signs of
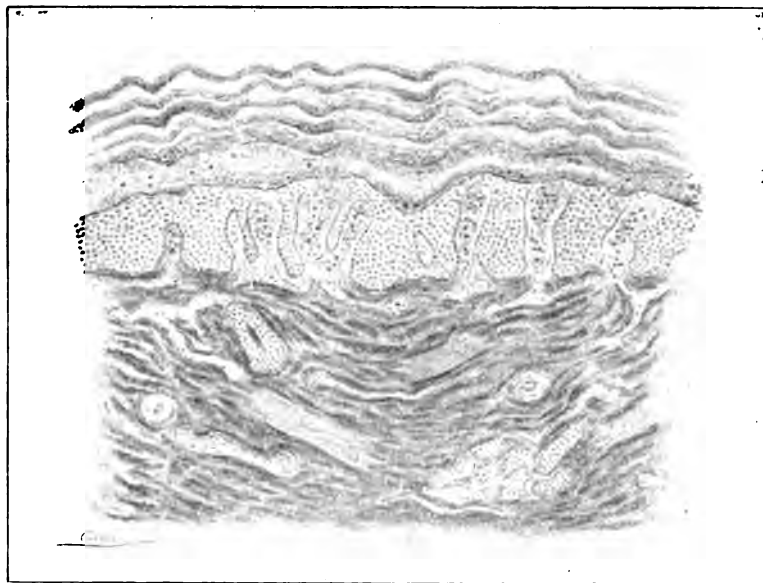
Fig. 1.—Papule of psoriasis. From a section stained with hæmatoxylin and orcein. (For account of this case *vide* ' Brit. Journ. of Dermat.,' vol. ix, pp. 31, 32, 1897.)

tremities. He was treated in the first instance by the administration of calcium chloride, but it was difficult to be persuaded that it had any controlling effect.

ERYTHEMATOUS NODULES ON THE HANDS SHOWING CENTRAL NECROSIS.

This patient came to see me to-day in the or-dinary course, and presents a peculiar condition of necrosing dermatitis or necrosing erythema of the extremities. She is a somewhat delicate girl, and has a distinct tendency to tuberculosis. She has tubercular glands in the neck, though they are

tuberculosis, either latent or active. Treatment directed against the tubercular tendency has always a good effect in these cases. She is applying locally an ointment containing salicylic acid and carbolic acid, with the idea of allaying the irritation which affects the skin.

HISTOLOGICAL FEATURES OF PSORIASIS AND PAPULO-SQUAMOUS SYPHILIDES.

In conclusion I would like to show you these two drawings. I am constantly having occasion to speak about the diagnosis between superficial syphilides, psoriasis, and dermatitis seborrhœica.

I am told by students that they distinguish a syphilide on account of its pigmentation, colour, and indeed on account of everything except the right thing. The distinctive feature which should be looked for in any syphilide is not its redness, not its pigmentation, but as a syphilide is a granuloma, the characteristic of it is its *infiltration*. Almost all the other erythematous eruptions, on the other hand, the circinate eruptions of which simulate syphilis, are erythematous and *not* infiltrated. I show you two large diagrams to explain my meaning. Here is a papule of psoriasis (Fig. 1), and here is a papule of so-called syphilitic psoriasis (Fig. 2), obviously a very misleading name. I ask

if you scratch off a crust of psoriasis you get a number of bleeding points. Here is the cutis represented, stained with neutral orcein; this stain acts on the connective tissue, and you see that beyond a few spindle-cell nuclei there is no infiltration; it is a disease characterised by *congestion of the papillæ*, and subsequent changes in the epithelium, owing to imperfect keratinisation.

Now compare with this what may be observed in a papule of syphilitic psoriasis so called. First of all there is little congestion, the whole of the cutis is simply packed with the cells of an inflammatory infiltration. The fibres of connective tissue are observed with some difficulty. You

Fig. 2.—Lesion of papulo-squamous syphilide, stained with methylene blue.

you to notice the difference in their anatomical features. Psoriasis is characterised by the erythema of the cutis, there is a considerable amount of œdema of the cells of the rete mucosum, which multiply rapidly, with the result that the interpapillary processes of epithelium become increased in size. On account of the erythema the papilla becomes larger and larger owing to congestion, it approaches the surface, and any lesion of the surface will rupture the top of one of these engorged papillæ, so that nearly always a psoriasis crust is mixed with a considerable number of red blood-cells. That is the reason also why it is said that

can therefore feel it between your fingers, and tell at once the difference between an inflammatory papule of so-called syphilitic psoriasis, and the erythematous patch such as one sees in dermatitis seborrhoica, pityriasis rosea, erythema multiforme, and of psoriasis.

I am frequently asked about these points by our students, and I therefore had these drawings made to show you this afternoon, as they may serve to emphasize my meaning.

ON A CASE OF
BULBAR DISEASE SIMULATING LEFT-SIDED SYRINGOMYELIA,

FOLLOWED BY

GREAT AMELIORATION OF SYMPTOMS OF NINE YEARS' DURATION.

BY

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THE patient is a married woman æt. 29. She now presents (Feb., 1898) the following symptoms.

1. Double semi-rotatory nystagmus, increased on looking to the left, with restriction of the fields of vision, especially on the left side.

2. Paralysis of the left side of the soft palate, and of the left vocal cord. There is no apparent paralysis or wasting of the tongue.

3. Partial left hemianalgesia, and thermal anæsthesia of the face, neck, and head, with blunted and, in parts, absent tactile sensibility over the same areas.

4. Left-sided seborrhœa capitis.

5. Trophic lesions in the shape of blisters occurring from time to time on the fingers of the left hand.

History.—Her own account of her illness is so clear that it may be given *verbatim.*

"In May, 1889," she writes, "I first felt anything the matter with my arm. I had a violent fit of sneezing, and then it was I first felt any pain. It was like pins shooting from the shoulder to the tips of the fingers. For months after that I could not bear a 'jar' of any kind. I went to a —— ——, and he said I had 'ricked' the arm, and it would take a few years to get quite well. It (the pain) went on until 1892. Then I noticed I could not tell hot from cold, as everything felt warm. I could take up a hot iron and not feel it. One day I had been breaking coals, and I must have hit my thumb, for in about half an hour my nail turned quite black. I lost the nail, and had a very bad thumb as well, but I never felt any pain. In 1894 I felt some-

thing the matter with my neck, but took no notice of it until one day, after pinning the brooch into my collar, I felt something drag, and I found I had pinned the flesh up as well. I think it was in the same year I had to keep my bed for a week with pains in the head and eyes. After I got up again I found it was great trouble for me to see or read anything, as everything seemed two instead of one. I found I could not feel on my face or head one side, and occasionally I had big white blisters on the fingers of the left hand. They usually came in the night, and lasted from eight to ten days." These blisters were filled with clear fluid; they dried up and disappeared without leaving a scar.

Between Christmas, 1895, and February, 1896, she had four apparently epileptiform attacks, in which she was unable to stand, partially lost consciousness, and "all seemed dark before her eyes." Each attack lasted two or three minutes, and was followed by a sensation of weight on the top of the head.

This made her think "she was going to have fits," so she consulted me at the Hospital for Epilepsy and Paralysis on Feb. 4th, 1896.

I then found that she had almost complete analgesia (for pin-prick and wire brush), and also thermo-anæsthesia of the left side of the head, face, neck, and of the chest to the level of the third rib, back and front; also of the whole of the left upper extremity. Tactile sensation was blunted over all these areas, and absent over the greater part of the left side of the face and neck. She could hear a light touch in the neighbourhood of the left ear, but could not feel it.

She had also double semi-rotatory nystagmus, and diplopia, increased on looking to the left, with marked constriction of visual fields (fields subjoined *). The pupils were equal, moderately dilated, and their reaction was normal. The fundus and optic discs Dr. Batten described as being "well within the limits of normal."

On April 9th, 1896, she had a fit of coughing, immediately after which, she says, "I entirely lost my speech ; I could not say one word plain, and I could not eat or drink. Solid food I could not swallow, and liquids came back through my nose."

On April 17th, 1896, she was admitted to

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* Kindly taken for me by Dr. Rayner Batten.

hospital, when, in addition to her former symptoms, the left side of the soft palate was found to be completely paralysed. Her speech was nasal, weak, hoarse, and almost unintelligible. The tongue was protruded straight and fully, but the character of the speech suggested defective movements for articulation.

I did not examine her larynx then, being somewhat alarmed at her condition ; but a week later I

on the left side of the tongue. The left nostril seemed, however, normally sensitive to the fumes of ammonia, but perhaps the fumes when inhaled affected the nasal nerves on the opposite side.

The sense of smell seemed blunted on the left side. Hearing was unaffected then, but some months later was found to be defective on the left side. She could only hear a watch tick within a yard of her left ear.
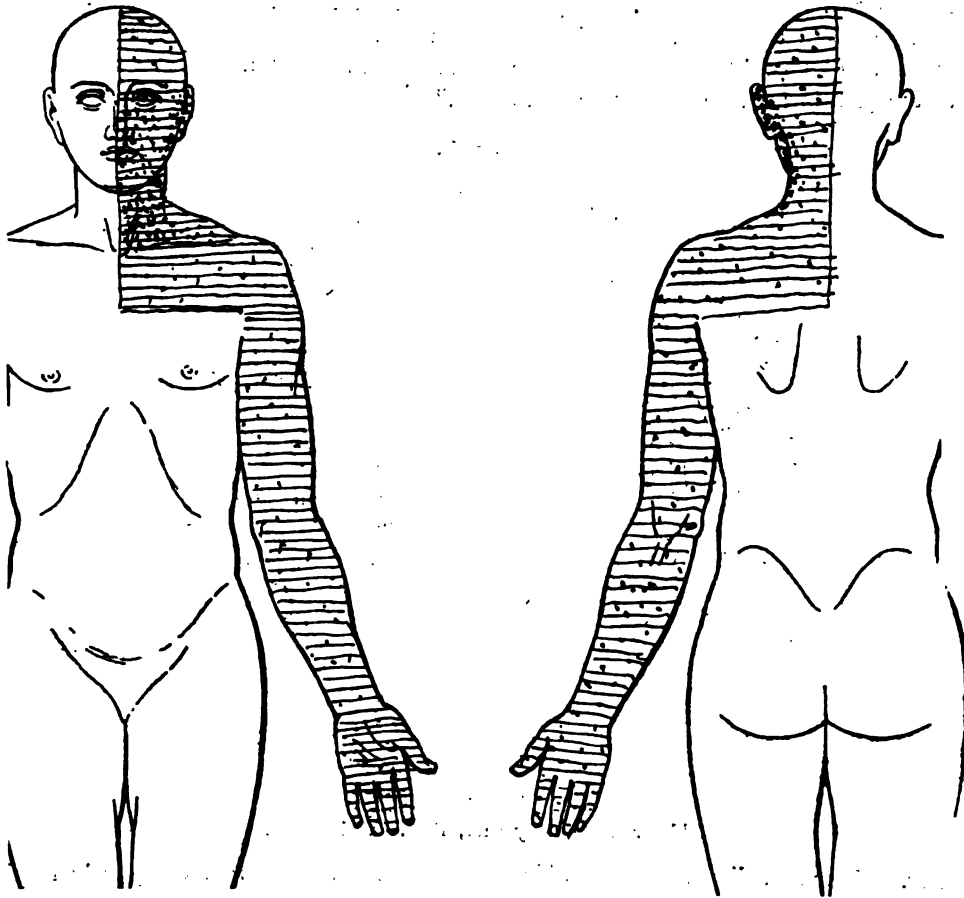
Analgesia and thermo-anæsthesia shown by ☰
Tactile anæsthesia by ∴. Complete where dots are thickest.

found the left vocal cord paralysed. She could swallow soft solids on admission to hospital, but liquids at once regurgitated through her nose unless she held it. Her throat had not been sore. The knee-jerks were active. The left hemianalgesia and anæsthesia involved the mucous membrane of the mouth and tongue. She could not feel the inside of her left cheek with her tongue, or tell when food was there, or taste it. Sugar, salt, and acids were undistinguished when placed

Muscular power was unaffected. There was no ataxy of the left arm. The elbow and wrist jerks were not exaggerated. There was no wasting of the limb.

Pain.—She complained greatly of left-sided neuralgia (trigeminal). The pain was like that of a burn. The motor branch of the fifth nerve seemed unaffected.

Vital centres.—Pulse and respiration were normal. There was no rise of temperature. The only

subsequent evidences of implication of the vagal centres were obstinate attacks of vomiting, chiefly occurring in the early morning. They were checked somewhat by hydrocyanic acid and bismuth.

She remained in hospital for fifteen weeks. Her progress is again best described by herself. She writes, " Every day I had two batteries (faradic and galvanic), on the face, neck, and arm. At first I could not feel either at full strength. In July, 1896, I found I could eat better, and drink by holding my nose, and I could feel a little of the battery, but the pain in my face did not seem to

" In February, 1897," she writes, " I began to feel better ; I felt a lot stronger in myself, and I could speak much better. B was the only letter I could not say. The blisters on my fingers were not nearly so large. In fact, I was better altogether, Then first I could drink anything cold without its coming back, and could swallow anything " (solid). She could not then drink hot liquids. " In August (1897) I found I could eat or drink anything either hot or cold, and from then I have been still getting better. I still feel the pain sometimes, but not nearly so often as I used to do."

.LEFT.
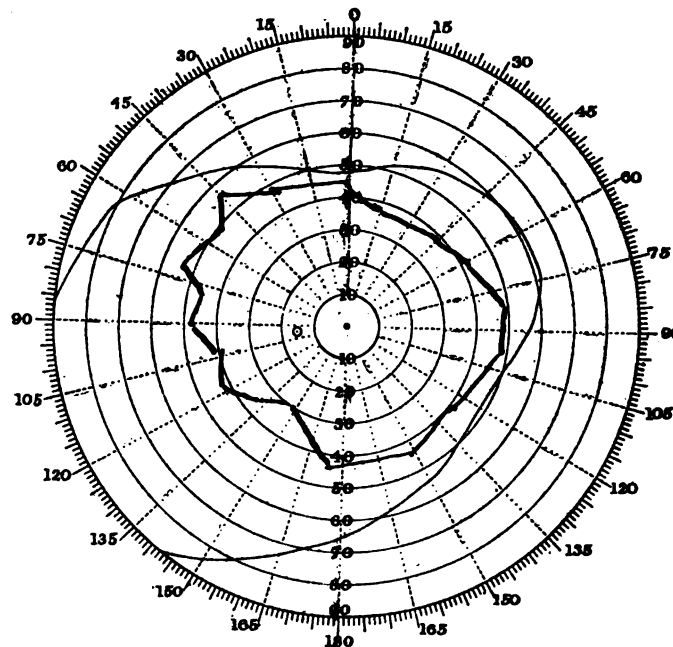
Field for white, May 21st, 1896. Vision = ⅔.

get any better. Many remedies were tried, which relieved only for a time. After I had a bad attack of pain it left a lot of greasy stuff on my face and head, and then a lot of dandruff would come, but only on the one side."

This was frequently verified. The face would become flushed and greasy on the left side, and large quantities of seborrhœic matter formed on the left side only of the scalp. Since leaving hospital in September, 1896, she has attended regularly as an out-patient up to the present time (February, 1898), and has been treated by electricity and tonics, especially strychnine.

Her left arm has now completely regained its sensibility to touch, pain, and heat, but she now has occasionally small blisters on the fingers of the left hand. She still has complete analgesia and thermo-anæsthesia of the left ear, and of the left side of the neck from the posterior border of the sterno-mastoid to the mid-line. Tactile sensation is mostly absent over these areas, and is blunted over the left side of the face and head.

The mucous membrane of the left side of the mouth and of the left nostril is normally sensitive, and so is the left conjunctiva.

She has still semi-rotatory nystagmus, increased

on looking to the left, and the fields of vision, especially of the left eye, are constricted (fields subjoined).

The left side of the soft palate and the left vocal cord are still paretic. The right cord moves well beyond the mid-line, but the left moves little if at all. On phonation the right side of the palate becomes dimpled, and the uvula is drawn to that side. The left side of palate remains at a lower level than the right.

The tongue is flabby and indented, but cannot be called atrophied. Its movements are perfect. The voice is nasal. Air escapes from the nostrils

on the left side, seemed quite in accord with such a view. Yet the diagnosis was not satisfactory. The peculiar nystagmus, increased on looking to the left, the long duration (seven years) of the symptoms, and their unaltered character were difficult to explain. There is, it is true, a form of hysterical nystagmus; but it varies in character, is produced by any attempt at fixation, and is not increased when the patient looks to one side rather than to the other. In this case the nystagmus was always semi-rotatory, and much increased when the patient looked towards the left. No definite weakness of the ocular muscles could, however,

RIGHT.
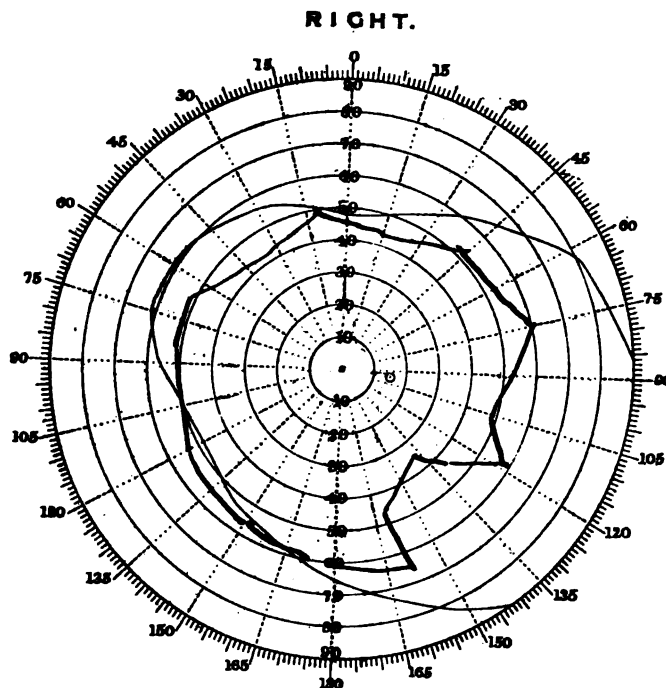
Field for white, May 21st, 1896. Vision = ⅔.

when she speaks. It is the true nasal voice, as compared with the false variety dependent on nasal obstruction.

In all other respects she appears to be in good health. Hearing, smell, and taste are now perfect.

Remarks.—When this patient first came under my care I must admit that I was inclined to regard her symptoms as hysterical or functional. The crossed amblyopia (the restriction of vision-fields being greater on the left side than on the right), the hemianalgesia and thermo-anæsthesia, the areas of blunted and absent tactile sensibility

be discovered to account for it. It was suggestive of early disseminated sclerosis rather than of hysteria.

Again, the patient was not hysterical in the ordinary sense of the term. She had not allowed her symptoms to interfere with her domestic duties. Her symptoms were constant and unchanging. She used the affected arm freely, but told me in a matter-of-fact way that since pinning her brooch to her neck and injuring her thumb she had to be very careful lest she should injure herself again. The attacks of trigeminal neuralgia were obviously very severe, but when free from pain she was

always ready to admit it. This is contrary to my experience of hysterical patients.

' All doubt on the point was, however, set at rest when the bulbar symptoms occurred. Hysteria could not simulate paralysis of the left side of the

spinal accessory nerves. The hypoglossal, vagal, and glosso-pharyngeal, also the auditory, nuclei seem only to have been temporarily disturbed. The grey matter of the medulla and cord, which transmits sensations of pain and heat (probably in the
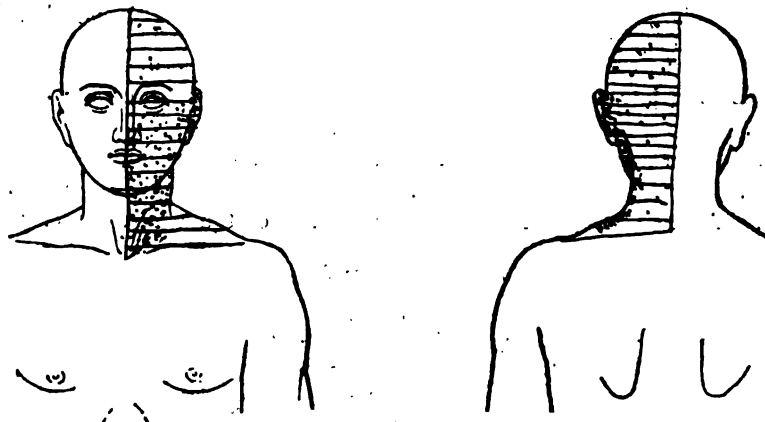
LEFT.
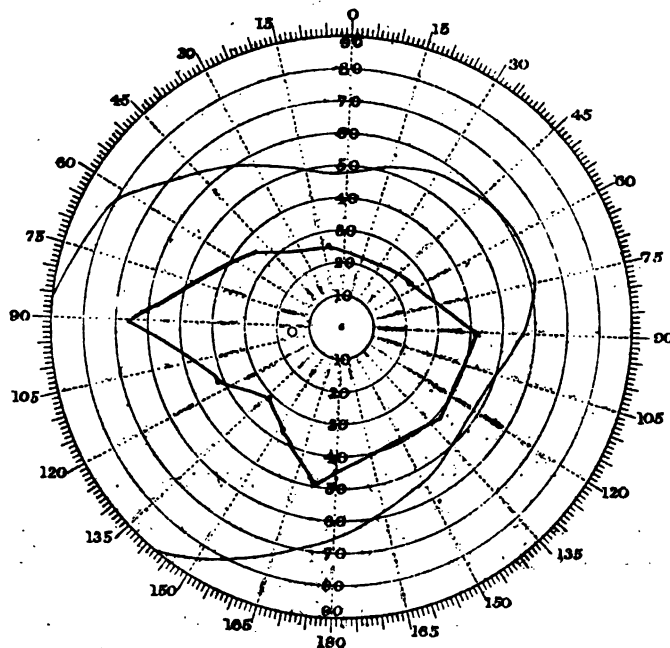
Field for white, February 17th, 1898. Colour vision good. No central scotoma.
Some hypermetropic astigmatism. Vision = $\frac{6}{6}$.

palate and of the left vocal cord, nor the dysphagia, and dysphonia which followed.

It was obvious when these symptoms supervened, that some organic lesion was present in the left side of the medulla, and involved the cervical and first segment of the dorsal spinal cord. The lesion must have affected the root of the left fifth, and

posterior commissure), was implicated, and also to a less extent the tracts for tactile sensation in the posterior columns ; but not the posterior horns, nor the paths of conduction of sensibility from the opposite side of the body.

The nature of the lesion is extremely difficult to determine, chiefly on account of the remarkable

subsidence of symptoms within the past year. This at once negatives the existence of a new growth, such as a glioma in the medulla.

Embolism or thrombosis of the left posterior inferior cerebellar artery would block the circulation of the portion of medulla affected, and might give rise to the symptoms. Indeed, in a case recently reported by Dr. Hun ('New York Med. Journ.,' April 17th, 1897) symptoms in many ways resembling those of my patient were found to be due to occlusion of this vessel. But in my patient there is no evidence of disease of the heart or vessels which would lead to either embolism or

The onset of the second stage (seven years later), in which the bulbar symptoms occurred, was marked by a fit of coughing.

It seems highly probable that on each occasion a convulsive respiratory effort produced hæmorrhage, at first into the cord, and secondly into the medulla. Yet such an explanation implies disease of the ruptured vessel, and, as stated above, there is no evidence of such disease affecting other vessels. Hence we must look for a special cause for extravasation of blood in these situations. Such a cause is the presence of a congenital or syringomyelic cavity in the left side of the medulla and
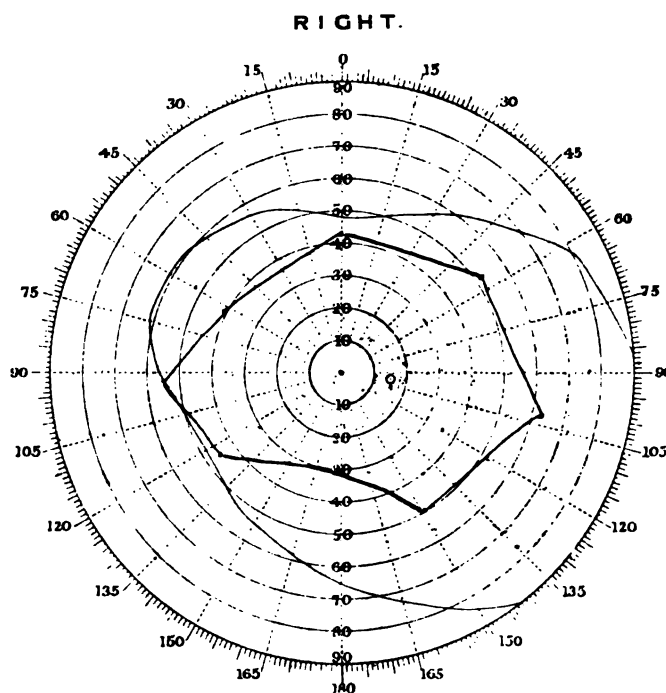
RIGHT.

Field for white, February 17th, 1898. Colour vision good. No central scotoma.
Some hypermetropic astigmatism. Vision = 6/9.

thrombosis. For similar reasons aneurysm may be excluded. She has never had rheumatic fever or syphilis. Atheroma at her age, in the absence of renal disease, would be very uncommon. A more likely interpretation of the facts is that they are due to hæmorrhage into the medulla and cord.

It will be remembered that the illness divides itself into two distinct stages. The first, in which the left arm and side of head and neck were affected, was immediately ushered in by a violent attack of sneezing.

cord. These cavities are said to be not uncommonly the seat of hæmorrhage, which aggravates existing symptoms and determines new ones.

Syringomyelia may be unassociated with symptoms, unless the walls of the cavity become unduly distended by blood or fluid, and so cause pressure on the parts around, or unless the embryonic tissue of which the walls of the cavity are composed takes on new growth.

The latter supposition is unlikely, because the symptoms have subsided instead of increasing. The subsidence of symptoms may have depended

on absorption of blood or fluid extravasated into the syringomyelic cavity. Hæmorrhage under these conditions need not cause such destruction of tissue as follows extravasation into the substance of the brain, and hence recovery is possible.

The symptoms—analgesia, thermo-anæsthesia—are well in accord with the diagnosis of syringo-myelia. Bulbar symptoms, nystagmus, and restriction of fields of vision have been noted in this affection.

The loss of tactile sensibility is perhaps greater than commonly occurs, but a certain amount of loss has been recorded in some cases.

It will be remembered that tactile sensibility was generally blunted over all the areas affected on the left side; but there was only complete tactile anæsthesia over certain parts supplied by the fifth nerve, and this may be accounted for by supposing the nucleus and root of the nerve to be implicated in the lesion.

The nystagmus and restriction of fields of vision need comment.

Henoch explains the association of nystagmus with head-nodding in children by supposing that the root nuclei of the spinal accessory and upper spinal nerves supplying the affected muscles of the throat and neck are closely related to those of the oculomotorius.

The spinal accessory nerve supplies the soft palate. Hence, far-fetched though the idea may seem, there may be a causal connection here between the paralysis of the palate and vocal cord and the nystagmus. The patient once complained of a constant tendency to turn her head to the left. Perhaps there was some weakness of the sterno-mastoid, which mainly derives its nerve-supply from the spinal accessory.

The restriction of fields of vision cannot be accounted for by a medullary lesion. Possibly it is due to functional disturbance of the cortical centres.

It resembles the crossed amblyopia met with in hysteria, but, as stated before, the patient is by no means hysterical.

Time alone will show whether this diagnosis of syringomyelia be correct. The case seems worthy of record, if only on account of the remarkable, and to me unexpected recovery which has taken place.

LARGE CYSTS OF THE EPIDIDYMIS.

A Lecture delivered at Tufts College Medical School

BY

CHARLES GREENE CUMSTON, M.B.S., M.D.,

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GENTLEMEN,—The subject of our lecture to-day is one of considerable interest, and little attention has been given to it in text-books; I refer to large cysts of the epididymis.

The ætiology of these cysts is rather obscure, but there exist a certain number of instances in which various forms of traumatism appear to be the distinct factor in their production. These traumatisms have been either a direct contusion, a blow on the organ, or a fall. A case is reported where the subject made a great strain to prevent a load from falling, and felt a sharp pain in the testicle at the time; a few days after a cyst made its appearance. Strains appear as factors in a number of other reported cases.

Gonorrhœa may certainly cause these cysts to form if the process has given rise to an epididy-mitis, which, as you are aware, often results in the obliteration of the efferent canals. Although this can happen, I do not think that gonorrhœal infection is a frequent cause, and it is rather difficult to admit that the lesion, which more especially occurs in the tail of the epididymis, which is, as you know, the most frequent seat of gonorrhœal epididymitis, can after a rather long period become the starting-point of a cyst situated in the caput of the epididymis.

A small cyst which has been present for a long time in the epididymis without giving rise to any trouble or even symptoms, may begin to increase in size after it has been irritated from various causes or has been the seat of a traumatism.

There is one thing more to be considered in the ætiology of these cysts, and that is the age of the patient. According to Reclus, out of fifty cases of spermatic cysts we have one 16 years of

age, one 18 years, and one patient of 20 years; six were at least 40 years old, eighteen were under 60 years, while the remainder were over 60. These figures relate to all varieties of spermatic cysts, and for large cysts of the epididymis we find two patients under 30 years of age, one 24 and one 27 years old; four patients were between 50 and 60, six between 60 and 70, while three were between 70 and 74 years of age. You will consequently notice that it is between the ages of 50 and 60 that this affection is the most frequently met with.

Many questions arise as to the explanation of the origin of cysts of the epididymis. In the first place these cysts must be divided into those containing spermatozoids, and those in which the latter are absent. Those cysts which do not contain the spermatozoid may be properly termed serous.

We will not consider the pathogenesis of spermatic cysts at any length, because those which develop from the hydatid of Morgagni, the vas aberrans of Haller, or the innominate body of Giraldès are, from their seat, excluded from the subject of this lecture. It is, however, not easy to establish a limit when we take into consideration those cysts developing primarily from the remains of the Wolffian body at points where these remains are included in the epididymis, or between this organ and the testicle. These cysts may distend and spread out the tissue of the epididymis in some cases, so that it is practically impossible to clinically distinguish those cysts which have developed from the epididymis.

The pathogenesis of cysts with spermatic fluid as the contents has especially received much attention, and many are the theories that have been emitted to explain their starting-point and the nature of their contents. Sir Astley Cooper believed that the cyst followed the obliteration of a seminiferous canal, which resulted in an accumulation of the secretion,—in other words, he considered it a retention cyst. This theory was also upheld by Liston, and was modified by Verneuil and Villegente. These observers admitted that a segment of the canals of the epididymis became strictured, and thus separated from the rest of the excretory system.

This hypothesis is based on important anatomical considerations, because when mercurial injections are driven into the vas deferens they show lateral enlargements appearing like sacculated aneurysms, both in the cones and straight tubes and in the tail of the epididymis. Sappey says that the straight tubes and cones frequently present dilatations the size of shot at their starting-points as well as cysts, which in the beginning are in communication with the cavity of the canal, but after they reach the size of a pea are shut off from it.

Dolbean and Reclus also remark that these cystic dilatations are especially frequent in subjects over forty years of age. Kocher, who admits the theory of dilatation of the seminal canals, points out that straight vessels and cones give way readily for the reason that the liquid secreted by the total number of seminiferous tubes must flow away through these ten or twelve canals, whose diameter progressively decreases up to the opening of the duct of the epididymis. Consequently the tension produced by the accumulation of semen is greatest at this point.

Usually these diverticuli remain small, but if they do enlarge they result in the formation of a spermatic cyst. Reclus adopts this theory, and credits this same origin to both large and small cysts of the epididymis as well as to a senile sclerosis.

According to Curling, these cysts usually form in the cellular tissue situated between the excretory ducts, as well as in their serous membrane covering. He attributes the presence of spermatozoids to a rupture of one of the tubes of the epididymis, with penetration of the spermatic fluid into the cavity of the cyst.

To sum up, then, we may say that both large and small cysts of the epididymis may have a common origin; the majority of large cysts contain spermatozoids, but in this case they are probably still in communication with the spermatic ducts. If this communication is cut off at an early period in the formation of the cyst, the elements of the semen will probably have entirely disappeared, in which case we shall have a serous cyst.

Large cysts of the epididymis usually occupy the globus major, which they either cover like a hat or are situated within it. At their lower aspect they reach the upper border of the testicle; behind they are in relation to the efferent vessels of the testicle, and often with the vas deferens. When they have reached a considerable size they are

covered by the visceral layer of the vaginal membrane on their sides.

As they increase in size, these cysts extend upwards along the spermatic cord, whose elements often become dissociated and are to be found on the external aspect of the cyst, while the testicle will usually be found adherent to the lower part of the growth. Very infrequently these cysts may reach such dimensions as to extend into the external ring of the inguinal canal.

You thus see that these cysts differ greatly as to their size, varying from that of a walnut to a large orange. Their shape also varies, but is usually distinctly circumscribed, regularly rounded or elongated in the vertical direction. Occasionally the cyst may present an uneven surface, which is due to the presence of several cavities in the growth.

The walls are usually thin, cellulo-fibrous in structure; the internal surface is smooth, and is lined by a continuous layer of flat epithelial cells. Only a few vessels are to be found running over the walls, which are quite adherent to the neighbouring parts, especially to the vaginal tunic. When the cyst is large it is apt to be very adherent to the testicle, from which it is with difficulty dissected off. Occasionally the walls may undergo certain changes which completely alter the appearance. Under the influence of attacks of subacute inflammation from a contusion or other cause, the walls of the cyst become hypertrophied, so that they will measure a centimetre in thickness in some cases. When they are thick there is an abnormal vascular supply, and rupture of the new-formed vessels will give rise to an hæmatocele of the cyst of the epididymis.

As to the contents, they are a liquid of opaque or milky tint, varying in quantity from 20 to 300 grams. This milky aspect is so characteristic of these cysts, that when seen we can be certain that spermatozoids are to be found in the fluid. If the liquid is allowed to stand for a time, the spermatozoids fall to the bottom of the test-tube and form a deposit of no great amount, while the remainder of the liquid becomes transparent and colourless. Microscopically examined immediately after it has been withdrawn by puncture we can detect a large number of spermatozoids in the liquid. Their movements are preserved, and they present all their characters as found in normal

spermatic fluid. If the amount of liquid withdrawn from one of these cysts is considerable, we may be obliged to resort to the centrifugal machine in order to find the spermatozoid.

Leucocytes are also to be found in varying amount, large quantities being present if the cyst wall is in a state of subacute inflammation. We may also find a few flat epithelial cells upon the lining membrane of the cyst. And, lastly, phosphatic crystals have also been met with in the fluid taken from these cysts.

The chemical composition of this liquid is, according to Duval, formed of a goodly amount of chloride of sodium, a salt that we know is only found in the most minute quantities in normal sperm. The phosphates are wanting, while in normal semen we find quite an amount of the phosphate of magnesia.

The density of the fluid contents of these cysts is 1008 to 1009, and is alkaline in reaction. It contains a small amount of albuminoid matter, although some authorities deny this fact. Sometimes albumin is found in large quantities, which fact has been explained by admitting that there was a subacute inflammatory process going on in the cyst walls.

You must know, however, that the contents of these large cysts of the epididymis are not always milky; their colour may be yellowish and transparent, quite similar to the fluid of hydrocele of the vaginal tunic, and in this case a large amount of albumin will be present. Although there may be such vast differences between the contents of these cysts, still there is no doubt but that they both have the same origin. It is certainly difficult to demonstrate that cysts with serous contents do not originate in the connective tissue situated between the ducts of the epididymis, but as a matter of fact nothing can be brought forward to uphold this hypothesis, and for that matter the structure of the walls of these serous cysts is quite similar to spermatic cysts.

In order to explain the absence of spermatozoids we must either admit that these cysts contain spermatic fluid in the beginning, but later on the liquid becomes serous on account of the disappearance of the spermatozoids, and because they cease to develop therein, or on the other hand, as we know that small cysts rarely contain spermatozoids, it is quite possible that when they develop into a large

cyst their contents remain the same, that is to say, deprived of the elements of the semen. I would also mention that in a monograph on the Wolffian body written some years ago by Follin, he admitted reticulated cysts without spermatozoids originated in Rosenmuller's body, while those cysts containing spermatic fluid started in the vasa aberrantia of Haller.

Let us now consider for a moment the histology of the walls of these large cysts. They are composed of three distinct layers, the first being the thickened and sclerosed vaginal tunic that the accumulating liquid has pushed forwards. The second layer is only connective tissue formed by a sclerosis of the pericanalicular tissue; while the third is the wall of the epididymis, whose muscular tunic has completely disappeared.

As yet I have only spoken of unilocular spermatic cysts, which are certainly the most frequently met with; but it is not uncommon to find these cysts with several distinct pockets. These pockets may open into one another by small orifices, or they may have no communications whatsoever with each other. Another variety of interest is the communication of the cyst of the epididymis with a hydrocele of the vaginal tunic, examples of which have been recorded by Reverdin and Desprès.

Cysts of the epididymis are often bilateral, and each cyst may have different contents, one being spermatic while the other is serous in nature. A cyst may co-exist with a hydrocele of the vaginal tunic, without having any communication with it, and likewise a large cyst of the epididymis may be present along with a varicocele or inguinal hernia.

There is one more condition of affairs to which I desire to call your attention, and although infrequently seen it is nevertheless interesting; I refer to a hydrocele developing in a cyst of the epididymis. Sir Astley Cooper has recorded a case in which he found the wall lined with a new membrane and exactly like an hæmatocele of the vaginal tunic. Other cases have been reported, and further on in this lecture I shall consider this question again.

Independently of ordinary cysts of the epididymis other cystic growths may be found in this organ, which have no relation to those forming the subject of this lecture. For example, a case was reported by Hénocque in which the testicle was arrested at the fold of the groin, between the skin and the external orifice of the inguinal canal. The spermatic cord and vessels were in the scrotum. For the last year the patient had noticed the absence of his testicle from the scrotum, and began to feel pain in the groin. Walking soon became difficult, and a tumour appeared at the seat of the pain. The tumour was very movable under the skin, and measured 5 cm. by 12 cm. As the scrotum on the other side contained an indurated epididymis and a hydrocele, it might have been thought that the patient was affected with a tuberculous trouble of the testicle becoming arrested at the external inguinal ring, both on account of the hereditary history as well as a doubtful condition of the prostate. The tumour was easily enucleated, while the spermatic cord and vessels were left *in situ*. On section the tumour presented two parts, one encephaloid and the other cystic. The parenchyma of the testicle was crowded to the periphery of the specimen. Microscopically the cystic part was found to contain ciliated prismatic epithelium, which led the observer to believe that the tumour grew from the epididymis, or perhaps Highmore's body.

At the early part of their formation large cysts of the epididymis are not noticed by the patient, unless they are the product of a traumatism, or that the traumatism has been the means of hastening the development of a pre-existing small cyst. Several years may go by before their size is sufficient to attract the patient's attention, but as soon as they have attained the size of a walnut or more, a unilateral oval tumour may be seen in the scrotum.

The skin of the scrotum is usually normal, and may be easily caught up in folds between the fingers. A methodical palpation of the tumour will show that it is seated in the lower part of the bursa. The growth may be soft, and distinct fluctuation will be perceived if it is only slightly tense; on the contrary, if it is well distended it will be found hard and elastic to the feel. At its lower and anterior aspect a harder and elastic lump is usually felt. This lump, which is often difficult to limit by palpation, produces a pain when pressed on, similar to that produced when the testicle is squeezed, and this is one of the best means at our disposal to judge of the relation

between the tumour and testicle. The epididymis cannot be felt at any part in the majority of cases.

Palpation of the parts situated above the tumour will reveal a normal condition of the spermatic cord, as well as complete absence of any pedicle uniting the tumour to the abdominal cavity. If you examine the tumour with transmitted light as you would do in cases of hydrocele of the vaginal tunic, you will generally find that the cyst is perfectly transparent, excepting at the lower and anterior aspect of the growth; but in some cases transparency is very slight, or may be completely wanting. The want of transparency is due to the presence of spermatic fluid in large quantities, which is infrequent; or the cyst walls may be very thick, as will occur in some few cases. When the cyst is multilocular, its transparency is diminished.

As to the functional disturbances, it may be said that they are usually not marked, because these cysts develop insidiously without giving rise to pain, excepting in some very few cases. Walking may be interfered with by the size of the cyst, and when it has reached a fair size the cyst will naturally be subjected to many slight causes of irritation, which will often result in local pain or neuralgic pains extending into the lumbar region, thighs, or abdomen.

Pressure on the tumour does not give rise to any discomfort.

The progress of these cysts is in most cases quite simple. They progressively increase in size, but extremely slowly; then they may remain stationary for some time, and then start increasing in size under the influence of divers causes.

But the progress is not always so simple. After a traumatism the wall of the cyst may become inflamed, and then we have violent pains and sometimes a slight rise of temperature. If you examine the liquid contents of the cyst at this time, you will find that it contains albumin, fibrin, and a certain number of leucocytes, varying with the intensity of the inflammatory process, but I am not aware that any case of suppuration of the cyst has been reported.

When the inflammatory process has subsided a certain amount of thickening of the cyst will remain, and the vascular supply is also increased, thus explaining why hæmatocele is liable to occur in the cavity of the cyst, several examples of this condition having been reported by Curling and others. Guyon has reported three cases of cysts of the epididymis which were transformed into hæmatoceles, and all of them were at least the size of an orange; the testicle remained normal, and was situated outside the cyst.

Hæmatocele occuring in these cysts are especially met with in young men, and when present considerably change the prognosis of the cyst, because the treatment which is usually sufficient to procure a cure of a simple cyst is without effect on the hæmatocele, and they have also been known to be the cause of the patient's death.

You will usually be able to detect the presence of an hæmatocele easily, because it is more painful and larger than a cyst, although the seat and its relation to the testicle are the same. The consistency of an hæmatocele is far more firm, although fluctuation may be detected if the blood has not coagulated completely, and if the neo-membranes are not too thick. Of course transparency is entirely absent in hæmatoceles.

Cysts of the epididymis may be the cause of atrophy of the testicle by direct compression of the organ or the vessels supplying it. If the spermatic cord has remained intact the testicle will retain its functions to a greater or less extent.

The diagnosis of large cysts of the epididymis is usually easy, but there are quite a number of tumours in the scrotum that present some symptoms in common with them. The situation of the testicle, the transparency of the tumour, and the normal condition of the spermatic cord will allow you to make a certain diagnosis in the majority of cases.

Cysts of the testicle differ in many ways from those of the epididymis. Cystic disease of the testicle usually occupies the entire organ, and when palpated the fingers readily feel the uneven surface; the testicle will not be found at the lower anterior aspect of the tumour, and its particular sensitiveness to pressure will be absent.

Hydrocele of the vaginal tunic may be easily mistaken for a large cyst of the epididymis in some few cases, but, as is pointed out by Gosselin, the position of the testicle at the lower and posterior aspect of the tumour, as well as the difficulty one has to palpate it, are good points in making a diagnosis. Besides, a hydrocele is far more transparent than a cyst of the epididymis.

A condition of affairs that has been observed

several times is a co-existence of a vaginal hydro-cele and a large cyst of the epididymis, and here the diagnosis is certainly difficult. The presence of the cyst can only be recognised after the fluid of the hydrocele has been withdrawn, and even then a bilocular hydrocele may be considered as present, but the puncturing of the second sac result-ing in the withdrawal of a milky liquid containing spermatozoids will settle the diagnosis.

A hæmatocele of the vaginal tunic differs from a cyst of the epididymis by its greater hardness and decided opacity. An hæmatocele occurring in a cyst of the epididymis can be distinguished from the same condition in the vaginal tunic by the presence of the testicle at the lower anterior aspect of the bursa.

When a cyst develops in the innominate body of Geraldès, which is situated high up in the midst of the elements of the spermatic cord, the diagnosis will be difficult. But these cysts are usually of small dimensions ; and if the testicle can be felt in normal relation to the epididymis (which is not enlarged), or if there be a space separating the cyst from these two organs, the diagnosis should present no difficulty.

On the other hand, if a spermatic or serous cyst develops in the vas aberrans of Haller, its rela-tion to the epididymis may be so intimate that even after puncture it may be impossible to make out the origin of the tumour and to differentiate it from a true cyst of the epididymis.

An hydrocele of the spermatic cord, that is to say, one developed in a non-obliterated part of the vagino-peritoneal canal,* may, by its size, shape, and transparency be mistaken for a cyst of the epididymis. Usually, however, the testicle and epididymis can be made out separated from the lower part of the tumour by quite a space, but in those cases in which the cyst is in close contact with the epididymis a diagnosis can only be made after puncture.

I shall not consider the question of diagnosis between inguinal hernia, varicocele, and non-transparent neoplasms of various natures develop-ing in the testicle or spermatic cord, because a distinction is at once made by examination. I know of no sign by which one can foresee whether the liquid contents of cysts of the epididymis are

* Cumston, " The Pathology of Congenital Hydrocele," ' Buffalo Medical Journal,' June, 1897.

spermatic or serous, but this is unnecessary, for it would in no way change the treatment, which we will now consider.

Serous or spermatic cysts of the epididymis are sometimes cured by simple puncture, but in the majority of cases the liquid is reproduced even after it has been withdrawn several times. But if puncture is followed by an injection of tincture of iodine one part, and alcohol two parts, this treat-ment will usually succeed.

Now, if after several punctures and injections performed at intervals of three weeks the cyst continues to refill in the same proportions as before the treatment, or if the cyst is in any manner an infirmity for the patient, an aseptic incision with enucleation of as much of the cyst wall as is possible should be performed.

Unfortunately the simple measures of treatment are dangerous in certain cases of multilocular cysts if they set up an inflammatory process in the cyst wall, especially when an hæmatocele complicates the situation, and under these circumstances inci-sion and drainage are imperative.

X-RAY BURN.

BY

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As a supplement to the cases of X-ray burn lately reported in the medical papers and reproduced in THE CLINICAL JOURNAL of March 23rd, the following history of an X-ray burn may be of interest. The burn was produced for purposes of experiment, in order to see how far the X rays might be applied to the removal of superfluous hairs. The electrical excitation of the tube was done by the large Wimshurst machine lately de-scribed in THE CLINICAL JOURNAL ; the tube was one of high penetration, and the production of X rays was abundant. The part experimented upon was the ulnar side of the back of the left hand, and this part was held at a distance of one inch, approximately, from the wall of the tube. Ex-posures were begun on January 20th, and continued until February 1st, but with three days missed. The time of exposure daily averaged half an hour,

and the total time was five hours; the longest exposure at one time was forty minutes. Nothing could be seen when the experiments were discontinued on February 1st, but on February 5th a little swelling and redness and a slight tingling began to be felt. By February 11th this had grown decidedly worse, and the ulnar half of the back of the hand looked like a large chilblain, swelled, livid, and ugly. It was tender but not painful. A slight scratch on that day was followed by the exudation of serum, and as I did not like its appearance the hand was wrapped up in lint and lead lotion for forty-eight hours, and then kept covered with dry lint and a glove night and day until the 23rd. The skin then peeled off in large pieces, bringing the hairs with it, and leaving a new and tender cuticle beneath, and in the course of another week this was strong enough to permit of the glove being discontinued. At present the skin remains smooth and absolutely hairless; the surface is slightly numb to a light touch, but is sensitive to painful impressions. It yet remains to see whether the hairs may grow again. On showing the hand to my friend Dr. Edkins, Joint Lecturer on Physiology at St. Bartholomew's Hospital, he suggested that the interval of time between the exposure to the X rays and the commencement of visible effects therefrom pointed very strongly to a condition of trophic change following a nerve injury, and this view seems to me to be the probable explanation, especially as it is supported by the impaired sensation which still exists over the injured area. There has also been a tenderness in the wrist-joint, slight but quite perceptible, and this has not yet completely disappeared. The interesting points are (1) that it is possible to produce X-ray burns with the static machine, though apparently with far greater difficulty than with the induction coil; (2) that with single exposures, up to forty minutes at least, the statical apparatus may be considered safe; and (3) that a part suffering from X-ray burn behaves like a tissue the nerve-supply of which has been injured, and that careful protection from cold and exposure of all kinds may help to avert the worst effects.

Itching of Urticaria.—Distilled water, 450 parts; cherry-laurel water, 50 parts; chloral hydrate, 5 parts; cocaine hydrochlorate, 3 parts.
La Provence Médicale.

NOTE.

The Conservative Agency of Shock.—
1. Surgical shock entirely unassociated with hæmorrhage is a condition rarely seen, and one which may usually be successfully treated in persons who are otherwise in good health.

2. Hæmorrhage, though small in amount, is a far more important factor in the production of surgical shock (as it is seen clinically) than we have been accustomed to think it.

3. This mixed shock (traumatic asthenia) should be designated by some distinctive title, or the term shock be construed to comprehend all the factors in its genesis.

4. While not proven, it seems probable that the effects of even a small continuous arterial hæmorrhage is to produce through its reflex action lower blood-pressure, and in general a condition so like true shock as to be very difficult of differentiation, particularly if the hæmorrhage is concealed, as in ruptured ectopic pregnancy.

5. Surgical shock, with or without hæmorrhage, must be construed as primarily conservative in its tendencies. The incident prevention of rapid exhaustion, of acute suffering, or great blood loss when the blood-vessels are opened, all tend to the ultimate saving of life.

6. Premature stimulation in the treatment of traumatic asthenia may defeat this conservative effort of nature. Bleeding should be stopped and proper provision made for the comfort and welfare of the patient before strong stimulation is resorted to, unless there is imminent danger of death.

7. Anæsthetics must be sparingly and carefully given to patients suffering from surgical shock (traumatic asthenia), chiefly because they completely obliterate the reflexes. The saturation of the patient with an anæsthetic may turn the scale against him, even though the direct effect of the anæsthetic be stimulant. The same rule holds good in regard to the employment of alcoholic stimulants if too freely used.

8. We should co-operate with and supplement nature's conservative efforts. They are always exercised in behalf of the patient, never against him.—Dr. WETHERILL, in *Journ. Amer. Med. Assoc.*, March 12th, 1898.

CONTENTS.

NOTICE.

A CLINICAL LECTURE

ON

GENERAL PARALYSIS OF THE INSANE,

AND OTHER DISORDERS OF THE NERVOUS SYSTEM CHARACTERISED BY GENERAL PARALYSIS, WITH CASES.

Delivered at the West End Hospital for Diseases of the Nervous System, February 22nd, 1898,

By FLETCHER BEACH, M.B., F.R.C.P.,

Physician to the Hospital, formerly Medical Superintendent of the Darenth School for Imbecile Children.

GENTLEMEN,—General paralysis of the insane, is on the Continent often called paralytic dementia; but that name is not adopted by British alienists. It is a bad term, because there are often maniacal and other symptoms which are quite different from those which are seen in the ordinary forms of dementia.

General paralysis of the insane is a subject upon which books have been written, so that you will readily understand that I can only give you a slight sketch in the time which is placed at my disposal, more especially as I shall have to allude to other disorders in which general paralysis is present. For the sake of brevity, I intend to use the term general paralysis only when describing general paralysis of the insane.

Before proceeding to describe the disease it will be well that I should say something to you on the causes and the age at which it occurs, and other details.

Ætiology.—The chief *physical* causes are sexual excess, chronic alcoholism, syphilis, cranial injury, and heredity. With reference to sexual excess, all authorities are agreed that it plays an important part in the production of the disease. This excess occurs not only in single but also in married men. Cases are on record in which a man advanced in age, and who has led a very dissipated life, marries a young wife, and as a con-

sequence gets general paralysis. The disease does not occur in weakly persons as a rule, but in those who are strong and more likely to give way to excess.

Alcoholic excess is also a frequent cause, especially when combined with other excitants of the disease ; and so is syphilis. Heredity is a factor in about one-third of the cases ; it is more frequent in males than females.

As regards the *moral* causes, the most common are anxiety, especially about business matters, which is a less common cause in the higher than the lower classes of life ; over-strain in anxious efforts to provide for the family ; prolonged intellectual labour and exhausting physical work when accompanied with an emotional condition. General paralysis is usually the result of a combination of causes.

With respect to *age*, general paralysis occurs chiefly between the ages of thirty and forty; it commences in men at the time when they have arrived at their prime, and often in those who have enjoyed and lived a fast life. Cases have been seen as early as twelve or sixteen years of age, and as late as sixty; but they are rare.

As regards *sex*, the disease is about four times as common in the male as the female. Few women die of it, and it is scarcely ever seen in ladies of the highest classes. According to Dr. Sankey, the liability is most common in males of the lower classes, and then in decreasing numbers, males of the upper classes, females of the lower classes, and females of the upper classes.

Before going further, it is important to mention that there may be general paralysis of the body existing for years without the slightest sign of mental disorder. No doubt in the end there is some mental deterioration, but this may be so slight that it scarcely attracts attention.

There are several varieties of general paralysis ; but it will be best to relate to you a simple and uncomplicated form first, and afterwards to refer to some of the variations from it.

There are three usually well-marked stages of the disease when fully established, but most important of all are the prodromal or premonitory symptoms ; for if any good can be done, it must be accomplished before the real symptoms due to degeneration of nerve structures have set in.

Premonitory symptoms.—The most important of these are perversion of the moral sense. A patient, who previously had lived a moral and consistent life will be guilty of theft, or will appropriate property which does not belong to him. There will be irritability of temper, a loss of determination of character, and he may go so far as to be indelicate in his manner, and give way to debauchery and licentiousness. The language of such a man is often coarse, rude, insulting, or blasphemous ; and he will lie and dissimulate in the coolest manner possible. At the same time there will be an intellectual change, and as this disease, in common with other forms of insanity, is a dissolution, the last and highest acquirements of the mind fail first. The memory becomes weak, and the patient will remember incidents which happened a long time ago with ease, while recent events are forgotten. Absent-mindedness, forgetfulness of appointments, weakening of the faculty of attention, are sometimes noticed, so that the patient either with difficulty carries on his duties, or altogether neglects them. In some cases the man becomes mentally confused, and is very forgetful, so that he cannot make the simplest calculation, or give the proper change to a customer. Sometimes the patient is despondent, and takes no interest in his business or the ordinary affairs of life, but if opposed he will give way to violent rage and fits of passion. Occasionally there is hypochondriasis. In other cases there is the opposite condition, and the man becomes irritable, restless, unstable, energetic in business, but lacking the foresight and judgment which is necessary ; or he becomes gay and full of self-assurance, and will put forward extravagant projects, or make large purchases of articles which are of no use to him, asserting all the time his greatness, importance in society, and his wealth. Sleeplessness, or broken sleep at night, is a common symptom ; and so is drowsiness, especially after meals.

The physical symptoms are severe headache, neuralgia affecting the head or limbs or the visceral region, giving rise to the sensation of a ball in the throat, or a feeling of fulness in the region of the stomach. In addition there are various subjective sensations, such as sparks before the eyes, a feeling of heat and cold, or a crawling sensation in the limbs. A loss of power in the lower extremities, or locomotor ataxy, is

present in the spinal form called the ascending form of general paralysis. Occasionally there is temporary loss of speech or transient aphasia. The finer movements of the hands are lost, and the muscular movements are often tremulous. You have only to examine the handwriting to observe this. The pupils are either contracted, unequal, or do not act readily on exposure to light. Occasionally there are slight convulsive seizures.

I have dwelt on these premonitory symptoms in order to describe to you what you should look for. In this stage patients come under the notice of the general practitioner, and it is essential that you should know what to observe. It is at this time also that treatment is of the greatest use. All the symptoms mentioned will not, of course, occur in one case, but have been collected from a series of cases which have come under notice in the early stage. Many of the symptoms may seem trivial in themselves, but it is the combination of numerous symptoms which throws light on the disease.

After a variable period ranging from a few months to occasionally a few years, the *first* stage of general paralysis sets in. The chief characteristic of this stage is mental exaltation, with increased restlessness and excitement. The patient boasts not only that he is a duke, a king, or an emperor, but that he possesses all these qualifications at the same time; or he will assert that he possesses millions of pounds, that he is capable of extraordinary feats of strength, and has the highest mental endowments in the world. I remember a patient at Bethlem many years ago—when I was a resident student there—who informed me, on my asking him what he had been doing the night before, that he had been up for a ride on the tail of a comet (there was one that year), but found it so hot that he had to come down again. You will see how extravagant the ideas of these patients are.

There is this difference between the delusions of grandeur in a case of ordinary insanity, and in the general paralytic; the former will believe in and stick to his delusions, while the latter will very likely have forgotten his delusion of yesterday, but will have invented a dozen others instead of those which he had already mentioned. A patient of this class is easily led off from one subject to another; but he will be irritable and give way to passion if opposed or thwarted in any way.

Another symptom is the purchase of large quantities of useless articles. Dr. Clouston mentions the case of one man who, before the disease was recognised, spent in a week £1000, which he had taken ten years to accumulate, and another who spent £7000 in a month. The patient is, as I said before, in this stage very restless, always on the move, constantly walking about, and will not sit still; or he writes large numbers of badly written letters; or talks, sings, or moves objects about without ceasing. In some cases there is destruction of clothing, and uncleanliness in the manner of eating, so that food is spilt on the clothes, or the patient will be careless of his dress and appearance, or dress himself in the most fantastic and absurd manner. Insomnia is a very common symptom in this stage, and hallucinations of sight and hearing may occur.

The chief physical symptoms are tremor of the tongue and twitching of the small muscles of the lips and round the eyes. There is a slurring of the words, and a difficulty in articulating words which contain many consonants. The pupils are often contracted, frequently unequal, and sometimes insensitive to light. The face is vacant and stolid when at rest, and the skin often has a coarse and ruddy or greasy appearance. The hands have lost much of their dexterity, and the handwriting is shaky; letters and even words are omitted, and there may be repetition of the words or sentences, making a very disjointed production. There is usually anæsthesia, and the senses of smell and taste are weakened. The knee-jerk is increased. The temperature may be normal, or vary from $99 \cdot 6°$ in the morning to $101°$ or $102°$ at night.

There may be a gradual transition from the first into the *second* stage, or epileptiform fits may occur. This stage is characterised by mental enfeeblement accompanied by muscular weakness. The fits frequently resemble the minor attacks—the *petit mal* of epilepsy, but sometimes are so severe that they are like the major attacks—the *grand mal*. Occasionally they are of a most violent kind, and the patient has a succession of them, and remains unconscious for days, or may even die of them. These fits are distinguished from those of idiopathic epilepsy by the fact that patients with general paralysis suffering from them rarely bite their tongue, and make no noise or cry, while the convulsions are not so severe, and the mental

symptoms are different. They do not occur in young patients as a rule, but in men advanced in years, and in those of weak constitution. After recovery from the fit, marked mental deterioration takes place. The memory becomes weakened, the emotional state of the patient is less stable, and occasionally there are hallucinations. He has no power of initiating any scheme, and does not now insist upon his delusions of grandeur, though he will still say, when asked, that he is rich and strong. He thinks that he can walk and do his business as well as before, but his legs are shaky, and his handwriting very tremulous. There is loss of facial expression, and the face looks heavy and dull. The patient puts on fat, and is quite contented with his condition. There is increased tremor of the lips and tongue, and speech is more hesitating, and the tone of voice is changed. The pupils are now often widely dilated, unequal and sluggish to light. The temperature is below normal, and the knee-jerk is not easily produced. You will notice, if you ask the patient to walk, that he cannot turn round quickly without a risk of falling, and in fact there is now no vigorous muscular movement. Ordinary sensibility is often lost. The patient may remain in this condition for years, or may improve to a great extent.

Sooner or later, however, he passes into the *third stage*, in which there is inarticulate speech, paralysis, and mental extinction. The tongue is put out with difficulty, and his meat has to be minced or passed through a sausage machine, and mixed with mashed potatoes, to prevent the patient bolting solid masses and choking himself. Speech is thick and indistinct. He cannot stand or walk steadily. His urine and fæces pass involuntarily. At last he becomes bedridden, his lower extremities become contracted, bedsores appear, and he dies of exhaustion, lung complications, or diarrhœa.

Varieties.—Instead of the state of mental excitement in the first stage, there may be symptoms of melancholia with hypochondriacal delusions. The patient will assert that his throat and gullet are stopped up; in consequence, he will refuse food, as he will say he cannot swallow it; or he will say that his bowels are rotten and gone, and that he cannot defecate. Mentally, he is sad, miserable, distressed, and may even contemplate suicide. In other cases the patients are anxious, restless, and disturbed. Often there are delusions,

the patients declaring that poison is put in their food, or that they are to be killed, or that they have committed sins too enormous to be forgiven.

Instead of melancholia, there may be dementia. In these cases there is gradual impairment and finally loss of attention, memory, and will power. To these losses are added sleeplessless, restlessness, destructiveness, and uncleanliness in their habits. There is forgetfulness, mental confusion, irritability, headache, slovenliness, offences against public decency, and even criminal assaults.

These are the chief forms of the first stage; but some authors, and especially Dr. Mickle, have enumerated other varieties of this stage, such as the forms in which delusions of persecution and mental stupor predominate, and the circular form, in which there are alternate periods of excitement and depression.

I mentioned in a former part of my lecture that there was a spinal or ascending form of general paralysis, and it will be necessary to say a few words on this disease. In the third stage of general paralysis there is paralysis of the lower extremities, but I am now referring to a form in which the paralytic precede the mental symptoms, or in which the former are the more noticeable. Clouston relates the case of a man who had had locomotor ataxy for seven years, and then became sleepless and had delusions of grandeur. There was trembling of the lips and tongue, and difficulty in articulating long words and sentences. He passed through the different stages of the disease, and died eighteen months after the mental symptoms were first noticed.

Dr. Savage mentions cases in which general paralysis commenced with lateral sclerosis, and says that this form of the disease frequently affects women as well as men, and occurs in patients who are much younger than those who are usually affected with general paralysis. In this form there is the characteristic spasmodic gait or spastic walk. The feet appear to cling to the ground, and are scraped or dragged forward instead of being lifted. The lower extremities are held in a rigid condition at the knees, owing to the contraction of the extensors, so that the pelvis and the limb as a whole are lifted in order to allow of the scraping of the foot forward. This is only a brief description of the gait, which once seen can never be mistaken. Besides this the knee-jerk and ankle-clonus

are greatly exaggerated, and the abductors and adductors of the thigh as well as some of the other muscles of the leg, and those of the arm when the disease extends upward, are easily made to contract by tapping their tendons in suitable positions.

The *duration* of general paralysis varies from a few months to three or four years. Some patients live for as long as ten or fifteen years, but these cases are rare.

In the spinal or ascending form of general paralysis the duration is longer than in other varieties of the disease, but if brain and spinal cord are attacked at the same time the patient's life is often short. The demented variety is usually chronic, but if the patient has epileptiform seizures he is very liable to death.

In some cases, especially those in which there has been much mental excitement, there seems to be an arrest or remission of the symptoms, and sometimes the arrest is so complete that the patients are discharged from asylums recovered, but only to be readmitted after a period lasting for twelve months or more. Though they may have apparently recovered mentally, there is generally some tremor of the lips and tongue, irregular pupils and feebleness, and, as Dr. Blandford says, they are never capable of work or business. So long as they remain quietly in the country they may do well; but if they attempt to return to work they break down at once, and have to go back to the asylum. This is a point of practical importance, inasmuch as a patient who thinks he has recovered may be of opinion that he is quite competent to manage his business or affairs. As a rule, patients who become insane have their property put under the care of the Court of Chancery, and the man who thinks he has recovered may ask you to make an affidavit in order to have it restored. On no account do this; the apparent recovery is only a remission of the symptoms, which will in time make their reappearance.

One of these cases of general paralysis, which I am going to show you, is a good example of the exalted stage of the disease. It is that of L. K—, a gentleman æt. 44 years, who became insane three months after marriage. When he was first seen he had various delusions, such as that he was being persecuted and was going to be imprisoned for life. His speech was slow and at times incoherent, and he could not sleep properly.

The cause is unknown, but may have been sexual excess, which I mentioned to you at the commencement of the lecture was a frequent factor. At the present time you will notice that there is tremor of the lips and tongue and blurring of his speech, which was observed when he came under treatment eighteen months ago. Twelve months ago he had a convulsive seizure, and since then the tremor of lips and tongue and blurring of the speech have become more marked. His expression is now cheerful, happy, and contented, but you will notice that he is constantly talking in a very incoherent manner. His delusions of grandeur are now very marked, and he will state in the most positive manner that he is the God of heaven, the Archbishop of Canterbury, the King of England, &c., all at the same time. Concurrently with these exalted ideas you will observe that his gait is weak and tottering, and that his pupils are slightly unequal and do not respond actively on exposure to light. The knee-jerks are present.

I mentioned to you at the commencement of this lecture that cases were met with which do not present mental symptoms for some time. The case of W. J—, æt. 45, which I now relate to you, is one in which the patient did not for some months present marked mental symptoms. There was no family history of hereditary disease, but one of his brothers had died from rupture of a blood-vessel in the brain. His brothers and sisters are strong and healthy. At ten years of age he fell from a height on his head, but no serious after-effects ensued. He has suffered from headaches ever since he was a boy at school. Six years ago a firm in whose employment he was became bankrupt, and W. J— lost his place. He was much worried at the time, and since then has been worried from having lost money. A year ago he was noticed to be "funny;" he thought he was losing money. Nothing further was noticed until two months before I saw him, when a hesitation and thickness of speech was noticed at times, and also loss of memory. A month before I saw him thickness of speech was continuous. When I saw him there was no loss of power in his arms; the dynamometer registered a pressure of 60 in both hands. There was also no loss of power in his legs. He had enjoyed good health up to the time of his attack. There was hesitation and thickness

of speech, and the upper lip and tongue were tremulous. The latter trembled when protruded. Pupils were contracted, but were equal, and acted to light. He felt sleepy during the day, both before and after dinner. His memory was weak. I saw him again a fortnight afterwards, when I noticed there was loss of power in both legs, which I was informed came on two days previously. He complained of pain in his head, and did not seem so strong-minded as he was. He was quite content with his position, though he had been out of work for six years. He thought he could walk five or ten miles, when he could with difficulty walk fifty yards. He was to come to see me again in a fortnight's time, but his sister came to inform me that four days previously he became restless, and could not be kept in bed. She had to struggle with him, not only to keep him in bed, but to prevent him escaping from the house by the front door. He had hallucinations of sight, and the day before I saw his sister he became so unmanageable that he had to be removed to an asylum. I had intended to show this case to you, but the disease was so rapid in its progress that I have been unable to do so, but by the kindness of Drs. Woods and White I am able to show you some cases which illustrate very well general paralysis of the insane.

From what I have said, you will readily understand that the *prognosis* of general paralysis is bad. It is a malady which ends in death.

The diseases of the brain associated with mental symptoms, which are apt to be mistaken for general paralysis, are alcoholic insanity, syphilitic insanity, paralytic insanity, some cases of epileptic insanity, acute mania with delusions of grandeur, choreic insanity, some cases of senile insanity, and some imbeciles who have stuttering speech.

Into the diagnosis of general paralysis of the insane from these I have no time to enter, but must proceed to mention the other diseases characterised by general paralysis which may be mistaken for general paralysis with slight mental symptoms.

They are syringomyelia, some cases of diphtheritic paralysis, multiple peripheral neuritis, disseminated sclerosis, bulbar paralysis, and amyotrophic sclerosis in an advanced stage.

Syringomyelia is a disease in which there is a cavity, or there may be cavities, in the spinal cord, due either to chronic inflammation of the grey matter of the cord, and subsequent disintegration, the " myélite cavitaire " of the French ; or to gliomatosis, that is a growth of neuroglia displacing the central grey matter and the posterior cornua. The latter is the more common cause.

The gliomatosis develops chiefly behind, but close to the central canal in the peri-ependyma, which is rich in neuroglia, and by degrees destroys the grey commissure and the posterior cornua, though the anterior are sometimes attacked. While extending at the periphery it undergoes softening in the centre, and ultimately a cavity or cavities is formed from the breaking down of the tumour. The wall of the cavity is surrounded by a smooth membrane, fibrous in character and apparently composed of connective tissue. Malformation or dilatation of the central canal of the cord is called hydromyelia, to distinguish it from syringomyelia, which has nothing to do with the central canal.

Syringomyelia is most usually situated in the upper dorsal and lower cervical regions, and chiefly occurs in the posterior half of the cord, and frequently in the posterior columns.

It is important to remember that the disease is congenital in character, and originates in some morbid condition during the development of the cord ; and when the symptoms are said to be due to some mental shock or to an injury it is probable that these causes may light up disease which has existed in a latent stage, or produces some change in the morbid condition.

So much for the pathology of syringomyelia, a disease which is often not recognised, and may be overlooked, and the causation of which I have thought right to bring before you.

The chief symptoms are loss of sensibility to pain and to temperature, with preservation of the sense of touch and of muscular sense, and atrophy of various muscles. After the loss of sensation has existed for some time, weakness of the muscles and wasting of the upper limbs will be noticed. The atrophy usually commences in the small muscles of the hand. There is atrophy of the thenar and hypothenar eminences and of the interossei, so that the interosseous spaces become deeper and the metacarpal bones become more evident ; deformities make their appearance, and the

so-called "claw-hand" is produced. The atrophy progresses slowly and gradually, and passes from the hand to the lower part of the forearm ; the arm generally escapes, but the muscles about the shoulder are in time attacked. If the lower limbs suffer, they are usually affected with spastic paralysis. Trophic disturbances are common, and consist of abscesses, whitlows, ulcers, skin eruptions, joint affections, and scoliosis. Occasionally the changes in the cord extend to the medulla and pons, and then the articulation will be less distinct, and there will be weakness and finally paralysis of the palate, lips, and tongue. The pupils are often unequal. It is this condition which may be mistaken for general paralysis ; but in syringomyelia the symptoms occur in youth and gradually develop, there is loss of sensibility to pain and to temperature, and gradual wasting of the upper limbs. These conditions do not occur in general paralysis of the insane ; and, moreover, in the latter disease there is in the first stage only weakness or slight inco-ordination of gait, while in syringomyelia, if the lower limbs are attacked, they are usually affected with spastic paralysis. The mental symptoms too are quite different. In syringomyelia there are irritability and depression of spirits, and in some cases hypochondriasis, while in the first stage of general paralysis of the insane—the only condition which at all resembles the last stage of syringomyelia—there are usually delusions of grandeur, or if there is depression it is much more marked than that which is seen in syringomyelia.

I am sorry to say that I have not a case of syringomyelia to show you, but Dr. Savill has kindly allowed me to read to you the notes of a case which was under his care. They are shortly as follows :—A female servant, æt. 28, came under Dr. Savill's care on September 25th, 1888, and died October 2nd, 1888. There was absolute flaccid paralysis of both legs, the paraplegia having come on ten months before Dr. Savill saw her, and exaggerated knee-jerks and ankle-clonus ; also complete anæsthesia and analgesia of both lower extremities. No weakness of either arm could be detected, but there was loss of power and anæsthesia in the third and fourth fingers of the left hand, which had lost the skin in one piece, like the finger of a glove. No atrophy or rigidity could be detected anywhere. The patient had a fainting

attack, and died suddenly. After death there was found glioma of the cord, which protruded through the calamus scriptorius and extended downwards to the mid-dorsal region. Down the centre of the glioma was a cavity containing viscid sanguineous fluid, extending throughout the entire length of the cord. This case does not agree with the classical description of syringomyelia I have given you, as the arms were not affected, but of course there are many varieties of the disease.

Diphtheritic paralysis when very extensive, and including paralysis of the soft palate, pharynx, tongue, lips, the lower and upper limbs, may be mistaken for general paralysis ; but the fact that there has been a previous attack of diphtheria will clear up the diagnosis at once. In some cases, however, the sore throat may have disappeared before the patient comes under notice, or may have been so slight as to have been quite forgotten, and then the diagnosis will be obscure. If the sore throat has been slight, there is no likelihood that a severe attack of diphtheritic paralysis will follow.

In general paralysis there is no paralysis of the soft palate, no regurgitation of fluids through the nose, or nasal tone of voice, no hoarseness or aphonia from paralysis of the muscles which approximate the vocal cords, and no strabismus from paralysis of the external muscles of the eye. In the first stage of general paralysis the knee-jerk is increased, but in diphtheritic paralysis it is absent. The only mental symptoms of diphtheritic paralysis are apathy and dislike of intellectual work. The tendency of diphtheritic paralysis is towards recovery.

In *multiple peripheral neuritis* there is general paralysis, so much so that, before the pathology of the disease was understood, Dr. Buzzard reported cases of the disease under the head of rapid and almost universal paralysis. Beginning with a feeling of pins and needles or numbness in the feet and hands, or vague pains said to be "rheumatic " which occur before the numbness, the patient finds there is increasing difficulty in doing his business. The numbness gradually spreads up his legs and arms, until in a short time he cannot stand or help himself in any way. In severe cases the facial, soft palate, and ocular muscles become involved, and the acts of swallowing and respiration are affected.

In many cases there is muscular atrophy, especially in the muscles below the knees and in the small muscles of the hands and the extensors of the forearms ; hence there are wrist-drop and foot-drop. There is intense pain if the affected nerves are subjected to pressure, and great hyperæsthesia in the skin supplied by the affected nerves. On the other hand, the tactile sensibility is indistinct, so that when the eyes are closed the patient cannot distinguish two points as separate until they are far removed from one another. The knee-jerk is absent at an early period of the disease.

I have no time to go further into the description of this affection, but the whole onset is different from that of general paralysis. There is no tremor of the lips and tongue, and no mental symptoms.

Disseminated or multiple sclerosis is a chronic induration or hardening, disseminated in patches in various parts of the nervous system. The disease as a rule develops gradually, and the commencing symptoms may be referred to the spinal cord or brain. When the disease begins in the spinal cord, there is paresis of the lower limbs, with a slow trembling gait, neuralgic pains, and disturbances of sensibility in the limbs. When it begins in the brain, there is giddiness, headache, staggering gait, tremors on voluntary movement, and impairment of speech and of vision. The tremor, as you know, is altogether absent, or consists only of a shaking movement of the head or trunk as long as the patient is at rest ; but as soon as he puts his will into operation and endeavours to take hold of anything the tremor commences, and increases according to the amount of effort he makes to execute a movement. Nystagmus is a common symptom, and strabismus with diplopia is frequently noticed. The speech is slow and hesitating, and has been called syllabic or scanning, because the patient pronounces separately each syllable. After a time bulbar symptoms supervene, the movements of the lips and tongue are affected, swallowing becomes difficult, speech becomes inarticulate, and saliva dribbles from the open mouth. Mentally there is emotional excitability, a weak memory, and impaired intelligence ; or there may be melancholia, monomania with delusions of persecution or grandeur, or complete dementia. The onset of the disease and the various symptoms are quite distinct from those general paralysis of the insane.

Amyotrophic lateral sclerosis is a disease which has been investigated and so named by Charcot, who divides its manifestations into three stages. In the first there is usually a feeling of numbness in the upper extremities, followed by motor weakness, wasting, and fibrillary twitchings of the muscles of the affected limbs. Soon the paresis and atrophy are succeeded by rigidity and contraction which create permanent deformities. The arm is adducted and held close to the side, the forearm is semi-flexed and pronated, the hand is flexed on the forearm, and the fingers are flexed and drawn into the palm. In advanced cases there is flattening of the thenar and hypothenar eminences, great wasting of the muscles of the palm of the hand, and of the forearm and arm. Occasionally there is rigidity of the muscles of the neck, and the head is fixed and cannot be moved in any direction. After a period, varying from two to nine months, there is paresis of the lower limbs, but not always atrophy of the muscles. There are, however, muscular tension and contractures which keep the lower extremities in the position of extension, and tonic or clonic spasms, or both, may be developed. The knee-jerks are increased, and ankle-clonus may be frequently detected. After a time the rigidity of the muscles diminishes, and atrophy and fibrillary twitchings make their appearance. In the third stage bulbar symptoms are developed, and there is paralysis of the tongue, lips, pharyngeal and laryngeal muscles. The consequences will be that the patient will have difficulty in articulating words, in swallowing, and in preventing the saliva from running out of the mouth. It is in this stage that the disease may be mistaken for general paralysis of the insane, but the mode of onset of the disease and the absence of mental symptoms will serve to distinguish amyotrophic sclerosis from general paralysis of the insane. Patients suffering from the disease just briefly described die in two or three years after the symptoms first make their appearance.

Bulbar paralysis, or labio-glosso-laryngeal paralysis, has been frequently referred to as a complication of some of the affections which have been previously shortly described, and it is the appearance of the symptoms of this disease which make those affections liable to be mistaken for general paralysis of the insane. In bulbar paralysis the tongue, lips, soft palate, pharynx, and larynx are

paralysed, and the symptoms previously mentioned are then noticed. In its initial stage it simulates general paralysis of the insane, but the condition of the pupils and the mental symptoms distinguish the latter disease, and the tremor of the lips and tongue, which are usually well-marked symptoms in general paralysis of the insane, are absent in bulbar paralysis.

With the exception of syringomyelia, I have not entered into the pathology of the various diseases which have been noticed, as it is of less importance than the clinical symptoms, and want of time has not allowed me to dilate upon it.

A few words on the *treatment* of general paralysis of the insane will be useful.

It is *preventive and medicinal,* and of these the preventive is the more important. Marriage of persons in whom there is a history of hereditary taint should be discouraged as much as possible, as the offspring will be almost sure to become insane when exposed to the battle and struggle of life.

As far as the individual is concerned, it is desirable that there should be no over-strain in education, but that the pupil's faculties should be developed in a rational manner, plenty of time being at his disposal for games and physical exercise, and, if possible, manual training. Loafing should be strictly prohibited. The moral training is quite as important as the intellectual. The teacher should endeavour to inculcate ideas of justice to others, duty, self-reliance, and self-restraint. It would be well that the master should be informed before the pupil enters the school that the boy is of a neurotic type, and must not be pressed on too much. Later in life the youth should not be placed in a position which causes anxiety and nervous strain ; but a clerkship in a Government office or in the Civil Service should be obtained, where the hours are short, and there will be plenty of time for exercise in the open air. The working man has less choice of occupation, but in his case manual labour, especially in the open air, will be preferable to employment for long hours in heated rooms. The diet, no matter what the patient's position in life may be, should be plain and nourishing. Alcohol in the shape of wine and spirits is injurious, and even beer is better omitted. As regards girls, particular attention should be paid to them at the period of puberty, when they are peculiarly liable to break

down and become insane. Over-fatigue must be avoided, and the brain be not overtaxed by too difficult lessons or competitive examinations. You will, no doubt, be consulted with regard to the education and occupation of patients of this kind, and these hints may be of use to you.

The premonitory stage, you will remember I said, was the time when treatment was of the greatest use, and I propose briefly to inform you how you should proceed in case you are called to a patient who is threatened with an attack of general paralysis. The first step is to remove the case from the conditions, including the occupation, under which the prodromal symptoms have arisen. The patient must be told to lead a perfectly regular life, free from excitement of every kind. He or she should rise early, take a bath, live on plain food, and take plenty of exercise in the open air. Golf is a game to be recommended, and riding, driving, and cycling in moderation are also useful. Light reading of an unemotional kind, as well as painting and fancy work, should also be made use of. The old adage to keep the head cool, the feet warm, and the bowels open, is particularly necessary in these cases, and the use of alcohol, tobacco, and coition should be discontinued. All causes which may engender anxiety or annoyance must be avoided, and severe work of any kind must cease. A contented mind must be cultivated, and Bacon's advice, "To be free-minded and cheerfully disposed at houres of meate, and of sleepe, and of exercise, is the best precept of long lasting," must be strictly adhered to.

When the disease has become established, removal from home is necessary. Gentle management is required, and every means should be employed to ensure mental contentment and rest. The diet at first must be spare and easily digestible, and the bowels kept freely open. Exercise in the open air and bathing are serviceable. Later on the amount of food may be increased, and in the later stages perfect cleanliness and the prevention of bedsores, by the use of the water-bed and the application of cotton wool and lead lotion to the bony prominences, are very important. If bedsores should form, they must be treated by the application of zinc or boracic lotion, or by dusting powder composed of equal parts of starch ˜˜ᵈ oxide of zinc.

The medicinal treatment is varied. When the patient is excited, digitalis in doses of 30 minims every four hours, the bromides of potassium or ammonium in the same doses, purgatives, warm baths, and cold to the head will be useful.; and at night, if the patient cannot sleep, a mixture of the bromides and chloral, or sulphonal alone, may be given with good effect. If, on the other hand, the patient is depressed, the free action of the bowels should be encouraged, and the administration of the tincture of the perchloride of iron, arsenic, or quinine will help to produce vigour in the paralysed limbs. When there are epileptiform seizures, bromide of potassium in doses of 20 grains every four hours may be given by the mouth, or, if the patient is unable to swallow, by the rectum, the bowel being previously emptied of its contents by an enema. In the status epilepticus chloroform should be inhaled, and if the condition is protracted, enemata of eggs and brandy or of peptonised milk are necessary. Should there be apoplectiform seizures, cold to the head, the free opening of the bowels by calomel, and the administration of the bromides are required. The application of leeches to the head and the administration of digitalis and quinine have been highly spoken of, as well as the immersion of the feet in hot water, with or without the addition of mustard.

Flexion of the Spinal Cord instead of Suspension in Tabes.—Eulenburg rather ridicules re-educating appliances, and advocates strongly the new substitute for suspension, stretching the spinal cord by bending the trunk forward at an acute angle with artificial, gradually increasing pressure. The patient sits with outstretched legs on a long, low table. A couple of leather straps are fastened to the edge of the table, and pass around the trunk in a figure of eight, crossing in front of the epigastrium and in the rear over the upper dorsal vertebræ. The ends hanging over the shoulders are fastened to a crossbar, attached by a rope running over a drum, to a turning crank below. Pressure is regulated with a dynamometer. Applied for five minutes or longer, two or three times a week, he has not observed any inconveniences in his four months' experience. It seems to be supported by the patients much better than suspension. The benefit was evident in the improvement in the ataxia, and the disappearance of the lancinating pain, &c.—*Deuts. med. Woch.*, February 3rd.

MEETING OF THE SOCIETY OF ANÆSTHETISTS,

At 20 Hanover Square, February 17th, 1898.

The President, Dr. DUDLEY BUXTON, in the Chair.

DOSAGE IN ANÆSTHETICS.

By Dr. A. WALLER, F.R.S.

Dr. WALLER said that since his attention had been directed to the study of anæsthetics from a physiological standpoint he had been gradually led more and more to trespass upon the domain of clinics, and to-day more than ever he felt that the results of the laboratory were worthy the serious attention of clinical workers. He had given to his remarks the title of "the dosage of anæsthetics," but, more properly speaking, his paper limited itself to the dosage of chloroform, as he would have very little to say about ether. His remarks would be in continuation of a communication he had made a few months ago at Montreal, and which had been published in the 'British Medical Journal' of November 20th, 1897. From that paper many readers thought he held a brief against chloroform; as a matter of fact he did no such thing. The considerations he was about to lay before them on this occasion were evident to his mind at the time he formulated the conclusions, which he then expressed in somewhat strong language, to the effect that at our present level of knowledge the conduct of a person in whose hands a patient should have met his death *by* or *during* chloroformisation for the purposes of a minor operation should be subject to close investigation. Looking at the literature of the matter, and looking closely into the reports of certain deaths, it appeared that those deaths had taken place because chloroform had been improperly administered, he did not say whether from carelessness or from ignorance; as a matter of fact he thought it had been from the lighter cause, namely, that of ignorance. Snow, forty years ago, made a statement to the effect that to produce the second degree of anæsthesia 12 minims of the anæsthetic in the blood are necessary; to produce narcotism of the third degree, about 18 minims are necessary; while to produce full surgical an-

æsthesia 24 minims are required. To produce death requires double the minimum amount which produces the minimum amount of anæsthesia, namely, 36 minims. That struck him (Dr. Waller) very forcibly, and he thought they were correct numbers to take as a standard of reference. From his own study of the matter, and from his study of the experiments of French physiologists—he referred especially to Paul Bert and to Dubois, of Lyons,—it came out with remarkable coincidence that the lethal dose of chloroform was twice the anæsthetic dose. It came out again if one took a rough calculation of what the average fluids of the body were, and what the percentage of chloroform was to be in the atmosphere which has to be breathed, but the coincidence was veiled by the fact that different units had been used by different people. The remarkable fact stood that the amount of chloroform to be present in the blood to anæsthetise a mammalian animal, including man, had to be between one and two per cent. of chloroform. It followed from that, physically, that the optimum method of giving chloroform would be that of Paul Bert, who gave titrated mixtures of chloroform in air, from 10 to 8 to 6 to 4 per cent. so called (the correction he would mention shortly, namely, that it did not really mean "per cent." at all). It really meant between 1 and 2 per cent. of chloroform if the liquids of the organism were to be brought to their optimum tenor of chloroform, which, according to Snow, lay between 18 and 36 minims, or between 1 and 2 c.c. of chloroform, or between 300 and 600 c.c. of chloroform *vapour*. He was not sure that he would be able to put the matter before them clearly verbally, because it was very difficult to make arithmetical arguments clear in that way, but he would endeavour to do so in the remarks appearing in print. It came out that the best means of chloroforming a patient should be by giving him such a titrated mixture; but that was impracticable. The attempt had been tried but given up in Paris, even though there was the weight of Paul Bert's authority behind it. In Lyons there was the opposition of a strong ether partisan, namely, Professor Ollier. Practically that method of giving the chloroform had been abandoned as too cumbersome for the practical surgeon. He had looked about to see what was the next best way of doing it, and in his judgment, if he might be allowed to

have a judgment on such a matter, that next best way was to make the patient breathe a properly titrated mixture of 1 to 2 per cent. on the Junker method, a system by which he should receive a given number of cubic centimetres or cubic inches of chloroform, such a number, namely, as should maintain the chloroform vapour in his blood at that optimum of between 1 and 2 per cent. Taking 30,000 c.c. as the volume of fluid in the body, and taking Snow's figure of 300 and 600 c.c. as the anæsthetic and the lethal doses respectively, the percentages between which the patient should be kept, come out as being between 1 per cent. and 2 per cent. Even comparatively, by his method of testing on the nerves of frogs, and in a parallel way upon his own person, be felt confident that in some such method lay safety in chloroform, if one could speak of chloroform and safety in one breath, looking at the statistics of the past few years. The exact numbers he had not in his mind, but whereas ten years ago the average number of deaths reported as due to chloroform amounted to something like twenty per annum, in later years, when people, perhaps, had come to use chloroform more fearlessly by what was called the open method, but which he would prefer to call the slap-dash method, the published death-rate had gone up almost into three figures. They must turn from those figures and come back to the proper dosage of chloroform. Everything seemed to point to the necessity of coming back to *quantity*, that was the essence of the whole matter. He would run very rapidly through the stages by which he came to the impression of the all-important necessity of giving proper quantities in chloroform administration. He had taken a sample of living matter—the most obvious sample, which had the property of excitability in a high degree, namely, nerve. This he had placed in a moist chamber, and leading into this moist chamber was a bottle containing the anæsthetic. Excitation was made at regular intervals of one minute, and the response of the nerve was indicated by a galvanometer, the movement of which signified whether or not the nerve was alive, and not only that, but whether its excitability was augmented or diminished.

They would see the period during which the nerve made no response,—in other words, it was immobilised, and then there was the gradual recovery of excitability. In some of them was in-

dicated the death by chloroform. He felt there was a very good contrast in experiments between that and what sometimes happened in the human subject as an illustration of the fact that with ether and chloroform—widely different in power—the chloroform was apt to immobilise definitely, and the ether immobilise for a time. He pursued his studies in the manner illustrated by the diagram. The apparatus consisted of a winchester flask, recording apparatus, galvanometer (the organ of expression through which the nerve recorded its responses). He took the winchester bottle and added to it a given quantity of chloroform fluid or ether fluid : $\frac{1}{10}$ c.c. of fluid chloroform when vaporised would give about 30 c.c. of vapour. The bottle had a capacity of 3000 c.c., $\frac{1}{10}$ c.c. fluid or 30 c.c. vapour in 3000 c.c. air = 1 per cent., $\frac{2}{10}$ c.c. fluid or 60 c.c. vapour = 2 per cent. He exhibited results on the nerves of strengths of 1, 2, 3, and 4 per cent. successively. The drawings represented copies of the originals, which he would put upon the screen later. It would be noticed that there was at first augmented excitability, then gradual abolition, with the stronger mixture a more severe abolition, and in the strongest still more severe and prompt abolition of excitability. He did the same thing with ether. Ether he took from 5 per cent. up to 30 per cent., because 5 per cent. ether was equal to less than 1 per cent. chloroform ; indeed, physiological effects were very much the same with chloroform and with ether six or seven times the strength. These three diagrams were really a summarised supplement to what he stated at Montreal a few months ago, and gave in a nutshell what he laid stress upon there. He wished to put before them the records of the mixture known as the A.C.E., but in varying proportions. He tried mixtures of chloroform and alcohol, chloroform and ether. He did not see anything in the mixture of chloroform and alcohol except that the alcohol tended to preserve the chloroform. But he wanted to see whether there was an actual summation of effects in chloroform and ether, or interference of effects between the chloroform and the ether. The result of these trials he gave as his principal datum at Montreal, namely, " that the power of chloroform is to the power of ether as one is to seven." He thought that thereby the step was taken in the right direction in the matter of allaying differences of opinion

between the various schools, and that was accepted by Lawrie, an acquiescence indicated not merely verbally, but he had agreed to it as a common basis. He thought Lawrie first notified his agreement in the phrase " Oh yes, that is about right, one ounce of ether = a drachm of chloroform." Therefore, in comparing the drugs, he (Doctor Waller) took $2\frac{1}{2}$ per cent. chloroform as equivalent to 20 per cent. ether. Then he went a step further, and tried a mixture of 2·5 per cent. chloroform + 20 per cent. ether, as compared with 5 per cent. chloroform, and he got a result of approximate equality of effects. Then he compared the effect of the same mixture with that of ether at 40 per cent.

The typical fact about any anæsthetic was that in small quantities it produced excitation, in large quantities diminution of mobility and abolition of excitation. The first effect of the anæsthetic was to excite, but as it tightened its grip on the subject the excitation became abolished. He alluded to CO_2 because the great fear of anæsthetists is from obstructed respiration, a fear which had been given expression to more especially by Lauder Brunton, that the trouble was due to the evil effect of CO_2. He (Doctor Waller) believed there was no right or reason for that statement. He believed the danger did not lie in the least degree in the presence or absence of CO_2 ; indeed, he believed the presence of CO_2 was an adjuvant of the anæsthetic. He was not denying for an instant the danger of obstructed respiration when he was face to face with the fact that chloroform was a most powerful poison. The danger was in allowing the optimum value of the chloroform to rise above 2 per cent. ; not because of the accumulation of CO_2, but on account of the imprisoned chloroform. Though there were many things which he should go into if he were speaking to an ordinary medical audience, still as he was addressing an audience of experts they were hardly worth entering upon ; he would, however, like to put before them some actual records showing the way in which he approached the case. First of all he would consider the records of the action of chloroform at 1, 2, 3, 4, and 5 per cent. Working in this way, he found that Snow's limit, namely, 5 per cent., was also the nerve limit. Generally speaking, if one got much beyond 5 per cent. the nerve was killed. He put upon the screen a record of a demonstration of

5·8 strength, which was nearly a kill. With 1 per cent. there was excitation; 2 per cent. nearly abolition; 3 per cent. to 4 per cent. more and more pronounced effect, which was proportionate to the cause, and he believed the same was true of the human subject. He would again show them two records as testifying to the merit of the method. The records of four successive doses of chloroform of 5 per cent. on the same nerve showed that one might take a given nerve and use that one nerve for a test by two drugs without fearing too great an inequality in the action of the second drug as compared with that of the first. He showed diagrams illustrating the effect of the third and fourth doses on the same nerve—a slightly more pronounced action in each case.

which struck him very forcibly. Lister's statement was that death from chloroform was almost invariably due to faulty administration. It was for his audience to decide what was and what was not faulty administration; what he (Doctor Waller) was pleading for on that occasion was for quantitative administration upon the lines laid down by Snow forty years ago. Lawrie said very emphatically that the chief factors in the safe administration of chloroform were diluted chloroform and regular breathing. The question then arose, how much diluted? That, again, was for them to decide. What he pleaded for was dilution below 2 per cent. He did so partly from his own experiments, and partly from the consideration of Paul Bert's experiments. Bert considered

10 % ether.   20 % ether.

In all cases the grey bar indicated the time of anæsthesia—eight or nine minutes in each instance. One cannot tell beforehand whether ether at 10 per cent. will produce excitation or not; you see it does produce excitation, and by the next record you will see that 20 per cent. strength produces depression.

He would ask them to follow him in an arithmetical consideration of what must be the case when a person was chloroformed in the rough and ready method, namely, by the open method, when an irregularity of breathing takes place. He thought it was very important to be alive to the principle that he had put down on the diagram, namely, the principle of Snow to which he had referred. He had added three statements

as fatal to his dogs 10 per cent., by which he meant 10 grammes per hundred litres; 10 grammes = 2000 c.c. per hundred litres, namely, 2 per cent. So that Bert's 10 per cent. was in reality Snow's 2 per cent. He was rather emphasising that because he thought a good deal of misunderstanding had taken place from the two languages in which the percentages were expressed. Only that day he was looking at Bert's experiments, and he saw that he quoted Clover's experiments and attempts with titrated mixture. These he stated to be 4·5 per cent., and quoted them as being on all-fours with his, and in his (Bert's) case 4·5 per cent. was not sufficient to anæsthetise. 4·5 per cent. in Clover's hands was, he believed, a dangerous percentage, which he thought they

could understand now. He believed there were fatal cases with a strength of 4·5 per cent.; his own study would put the proper percentage of chloroform at 2 per cent.

Another thing which struck him as very singular was that in order to maintain within the fluids of that reservoir called the human body, a percentage of between one and two per cent. very much less chloroform was necessary than was stated by the earlier observers, even less than was stated by Snow, much less than was stated by Paul Bert. From Dr. Carter's series of cases it appeared that an average dose of 5 minims per minute was sufficient, and it was for them to say whether it was to be adopted or not. That meant about 90 c.c. of vapour per minute was sufficient to keep a patient anæsthetised for an ordinary surgical operation. He would invite them to consider how that worked out. 90 c.c. of vapour per minute, at twenty respirations per minute = 4·5 c.c. per respiration. Taking the orthodox number for tidal air—500 c.c. —that came out at something like 1 per cent. But as a matter of fact the normal tidal air was too high; it was really more like 250 c.c., which brought the percentage back to 2 per cent. As before, therefore, from the study of the clinical cases as well as from the physiological study, whether on the intact animal or upon a fragment of living matter, the result came out with remarkable unanimity, namely, that the proportion of chloroform was not to exceed 2 per cent.

The first step is to recognise the fact that as regarded the rough and ready use of an anæsthetic one may not take chloroform and ether as being at all on the same footing. In using chloroform one is dealing with a weapon seven times as powerful as the weapon in the case of ether, and he pointed out that it was not a weapon which may be used in a rough and ready manner for the ordinary practices of minor surgery, and it was in minor surgery that nine tenths of the cases of death from anæsthetics occurred and still do occur. As regards, however, the measured and legitimate use of chloroform, it came to be a question of measurement, and he wanted to urge upon his hearers the adoption of that as a principle; it was a question of quantity per time, and what was to be aimed at in order to abolish death by chloroform was attention to that very point. He pleaded for some agreement as to quantity amongst those who lay down the law in this matter of anæsthetics. If chloroform continued to be given in a haphazard manner deaths were bound to occur. He asked them to consider a patient first holding his breath, and then taking a gasp of 1000 c.c. of air charged with chloroform vapour under the administration of some one who was not penetrated with the knowledge of the relative values, and who held a strong mixture close to the patient's nose, say 10 per cent. by the "open method." Moreover, how could they, by the open method, maintain the uniformity of strength? It seemed to him absolutely necessary that they should adopt, if not the method of Paul Bert or of Clover, which was perhaps impracticable, then that of Junker, so that one might know how much chloroform was being given per minute. He had made a comparative test, and in the case of any question on the point he would be able to show the plates embodying the results of those experiments. Taking first the Junker apparatus of Krohne and Sesemann, he tried the effects on a piece of living nerve in a moist chamber, and also upon his own person. He was very much struck by the coincidence of the impressions on the nerve tissue and on himself. The question of the best means of giving the dose which was decided to be the best, that was a matter for practical anæsthetists, and was a matter upon which, of course, he had not touched on that occasion. As to the relative merits of chloroform and ether, if he had to take an anæsthetic himself, or his wife, or his children, he would take or recommend chloroform, but he would be unwilling that a greater percentage than 2 per cent. should be used.

Extra-uterine Pregnancy.—Dr. J. P. Nedoroff says of extra-uterine pregnancy: 1. That ectopic gestations of one month's duration should be treated with the electric current, and that the middle of the fourth month should be looked upon as the border-line of the period during which electrical treatment is applicable. 2. That in hæmatoceles following extra-uterine pregnancy it is the only possible treatment up to the third month. 3. The remaining cases are to be treated surgically.

New York Med. Journal, March 19th, 1898.

DEMONSTRATION OF CASES

At the Monthly Meeting of the North-West London
Clinical Society, held at the North-West London
Hospital,

Dr. MACEVOY in the Chair.

The Tallerman Treatment.

DR. KNOWSLEY SIBLEY showed a case of Bright's disease associated with asthma and bronchitis. A man fifty eight years of age, employed in a horse-yard had suffered from asthma on and off for twenty years, especially in the winter; for the last three years he had also had a good deal of bronchitis. Two years ago he had dropsy of the legs, which lasted for five months; this was probably associated with albuminuria. He was in University College Hospital in September, 1895, for eight weeks, and again in January, 1896, for three weeks with the present complaint. Patient first attended as an out-patient at the North-West London Hospital at the beginning of April, 1896. He then had frequent attacks of asthma, the pulse was very firm, and there was a good deal of albumin in the urine. He attended regularly from this time until November, and the following drugs were in turn prescribed, but without giving him any real relief: turpentine, iodide of potassium, ipecacuanha, senega acids and stramonium. On November 26th the following note of his condition was made :—" Patient had a very bad attack again last night, with great choking and dyspnœa. For some time it has been impossible for him to lie back in bed. There are a few rhonchi, especially on the right side; the second cardiac sound is much accentuated, the first sound not clear." On November 30th he was first treated by the Tallerman dry hot air method, the right arm being placed in the apparatus. The breathing, which was much laboured before, was greatly relieved by the bath, and although no change was made in the medicine he had a very much better night. On December 7th he had his fourth bath, and the nurse made the following note:—"Slept very well after last bath, seems much better; says he has not felt so well for months." On December 17th Dr. Sibley made the following note :—" Patient has had seven baths, is better than he has been at this season of the year for many years, very little rhonchi left. Baths were

discontinued at the end of January, 1897, he having then had fifteen. By the middle of February, 1897, he was able to sleep for seven or eight hours together; at the beginning of November he went to a convalescent home for three weeks, which did him good. On December 9th he came to the hospital again, the cough having become much worse, and he was nearly choked with the phlegm; after one or two hours' sleep he would, every night, wake up in great distress, and be unable to get to sleep again for some hours. The pulse was very firm, and rate 80; there were scattered rhonchi over the lungs, with very prolonged expiration. There was a small quantity of albumin in the urine. On December 13th he recommenced the baths, with the result that he slept the whole night afterwards, and felt much better the following day. The baths have been continued since at intervals, with the result of great improvement in every way. For some days the albumin quite disappeared from the urine, but it now reveals a slight trace again occasionally.

Dr. HARRY CAMPBELL congratulated Dr. Sibley on the good result he had obtained. The question arose whether the patient was better than he would have been by the ordinary hot air baths. He noticed the patient had tortuous temporal arteries, but he did not know that that had any diagnostic value, probably not; also that he had a good head of hair. It would be interesting to note whether people with granular kidney were less apt to go bald than others; seeing that their arteries are comparatively incompressible, one would expect them to be less liable to be strangulated by pressure of the hat than low-tension arteries.

Dr. GUTHRIE asked what effect the hot baths had upon the secretion of urine. Personally he was not fond of hot baths in nephritis, because there was always a certain risk; the perspiration reduced the amount of water available for excretion by the kidneys, and also the amount of poisonous substances excreted by the skin was very much less than that given off by the kidneys, so that there was danger of the accumulation of these substances on account of the smaller quantity of water passed by the kidneys.

Dr. SIBLEY, in reply, said it was impossible to say in any particular case what were the comparative values of ordinary hot air or Turkish baths, and of the Tallerman method, but he had a number

of patients treated by the Tallerman baths who had previously had the ordinary hot baths without benefit, but they improved distinctly under the Tallerman system. The temperature under the latter was much higher than in any other form of bath, and the reaction much greater ; the temperature could be borne up to 250° or 300° F. for an hour or more at a time. He agreed with Dr. Campbell that tortuous temporal arteries were not necessarily diagnostic of atheroma, because their prominence might be due to transparency of the skin and emaciation of the tissues of the temporal region. The question asked by Dr. Guthrie regarding the secretion of urine was a very important one, and it was a subject he was working at. He was coming to the conclusion that when the patient had had a few baths the quantity of urine secreted was increased, notwithstanding the profuse perspiration, and the uric acid and urea excreted increased as time went on. At the time of starting the baths the relation of uric acid to urea was often 1 to 33 and 1 to 40, and after a few baths it rose to 1 to 17 and 1 to 20. Some interesting observations with the Tallerman method were made a short time ago in one of the French hospitals, and the results were particularly valuable because the patients were not having any drugs internally. ' La Presse Médicale ' published these cases, which were treated at the Laennec Hospital, Paris, under Professor Landouzy and Dr. Oulmont.

Raynaud's Disease.

Dr. HARRY CAMPBELL showed a girl of sixteen as a case of Raynaud's disease. As long as she could remember she had suffered from cold hands and feet. She had three brothers and three sisters perfectly healthy. None of her relations suffered from the affection, but their circulation was said to be somewhat sluggish. The patient's hands were worse on exposure to cold, when they became numb. She complained of the same condition in a less degree in the toes ; this she first noticed when ten years of age. He asked for hints as to treatment. The sphygmographic tracing he was sending round was suggestive of a contracted artery. Dr. Coleman, who was assistant physician at the hospital two or three years back, examined the blood in the affected fingers of a case of the same disease, and discovered broken-down blood-corpuscles in the affected fingers, but not in the

blood of the other fingers. It was an interesting question whether the broken-down blood-corpuscles which were observed in the blood during an attack of paroxysmal hæmoglobinuria were due to the breaking up of the corpuscles in and by the contracted vessels.

Dr. GUTHRIE mentioned that Raynaud's disease was really a paroxysmal affection, and was due to spasmodic closure of the arterioles ; if the present patient had always suffered from cold fingers, the case was probably not in the same category as Raynaud's disease. He thought it was only very rarely that paroxysmal hæmoglobinuria was met with in connection with Raynaud's disease. Hæmoglobinuria was dependent on the blood condition, whereas Raynaud's disease was due to a neurotic or nervous condition. He would like to know if there was any history of syphilis in the family.

Dr. SIBLEY was of opinion that the case was not one of Raynaud's disease as originally described by him. Raynaud's disease was generally confined to one or two fingers of a hand, and was more paroxysmal in character. It would be interesting to hear what was the condition of the hands in the summer-time. Possibly it might ultimately become a case of Raynaud's disease. The treatment indicated was to improve the circulation and nutrition, and keep the parts warm. He would also suggest that she should have the Tallerman hot air baths ; indeed, it appeared a very good case for them.

Dr. SUTHERLAND thought the case was on the borderland between physiological and pathological conditions. A condition of persistent blueness of the hands was not infrequently met with in out-patient practice, especially in girls about the age of twelve or fourteen. In some cases, as in the present, it was difficult to say whether it was a general weakening of the circulation due to cold, or whether it was a true case of Raynaud's disease.

Dr. MACEVOY said Charcot used to regard some of these cases of blue œdema of the fingers as hysterical, due to vaso-motor disturbance, probably emotional in origin. The patients were usually about the age of this girl. It would be interesting to hear whether Dr. Campbell had tried the effect of a vaso-dilator, such as nitrite of amyl.

Dr. CAMPBELL, in reply, said it might possibly be that the arteries going to that hand were

abnormally small. He was familiar with the cases which Dr. Sutherland referred to, but he would be inclined to think they were even more common at the climacteric than at puberty. Replying, he said the hands were in the same condition in the summer as in the winter. He would try nitrite of amyl, and report the result to the Society. He thought Dr. Sibley's suggestion of hot air baths was a reasonable one.

Operative Treatment in Tubercular Peritonitis.

Dr. SUTHERLAND showed a child, eight years old, the subject of tubercular peritonitis. In the early part of 1895 she had scarlet fever, and came under his care three months after returning from the fever hospital. Her mother noticed that she had become languid, and the patient complained of sickness and abdominal pain. When she came to the hospital he found that the abdomen was enlarged and very rigid, but there was no tenderness on palpation. Above the umbilicus was a band of rigid tissue two inches broad, sloping obliquely upwards. Deep pressure revealed a few smaller masses, and over the abdomen generally there was a very marked feeling of increased resistance. During her stay in the hospital her temperature was irregular, sometimes rising to 101° and sometimes to 103° at night. She complained of painful attacks in the abdomen and general discomfort. She was put on medical treatment—cod-liver oil and mercurial inunction—for two months, but the condition remained unchanged. Then he decided that the case was a suitable one for laparotomy. The hospital wards were closed for a time, and the patient went home to await operation. Diarrhœa, sickness, and loss of flesh continued, but the distension of the abdomen did not increase. She continued for a time longer under out-patient treatment, and six months afterwards he saw a distinct improvement in the condition; she had begun to put on flesh, and the acute symptoms had disappeared. The abdominal condition persisted, but she had gone on improving ever since. They would now see that the thickening in the abdomen had almost disappeared. Dr. Sutherland proceeded to discuss the indications for laparotomy. A feature in this case was enlargement of the liver. It was an old-fashioned theory, considered by many people to be exploded, that

chronic venous congestion was unfavourable to the growth of tubercular tissue, but he was rather inclined to support that idea. In the present case he believed there had been venous congestion from impediment to the portal circulation. Certainly in a large number of the cases he had seen the liver had been very much enlarged, and he thought the prognosis was thereby rendered more favourable.

Dr. GUTHRIE said he had quite an open mind as to the value of laparotomy, and of leaving the cases alone surgically, and quoted instances in his own practice of improvement under both conditions. Of course, in those cases which appeared cured there were probably smouldering ulcers, and it was never known when they might burst out into activity.

Dr. MACEVOY said he believed operation in these cases was supposed to be fairly safe, but he recorded a case to the contrary, the patient dying the day after operation. Many of such cases seemed to get well with mercurial inunction and general treatment.

Dr. SUTHERLAND in reply said his experience was similar to Dr. Guthrie's, that they should try medical measures for a considerable time; he believed the disease was much more curable by these measures than used to be believed.

Odontoma.

Mr. BARRETT showed a specimen, from a patient aged twenty-three, of odontoma, and a cast of the jaw from which he had excised it. Three weeks before he had severe pain on the right side of the mandible; he put on poultices, and a swelling arose. He bore the pain one week longer, and the doctor lanced his gum. The patient could not remember having had any teeth extracted on that side, and did not know that any teeth were missing. The second bicuspid and second and third lower molar teeth were missing, and there was a very great expansion of the jaw behind the first molar. On the surface between the masses of granulation tissue a gritty substance could be seen. The growth came away with some difficulty, having a considerable portion of the capsule attached to it. The wound was syringed out and packed with iodoform gauze. A week after operation, on taking out the packing, the crown of a molar tooth could be seen at the bottom of the cavity. The growth itself was a rough nodulated and

irregular cube, measuring seven eighths of an inch antero-posteriorly, and three fourths of an inch laterally, and seven eighths from above downwards. The capsule was a fibro-cellular structure, and the growth itself was an agglomeration of dental tissue, in which the tissues were arranged in wrong order, the enamel being inside. Mr. Barrett concluded by an outline of the researches connected with the subject.

THE TREATMENT OF GONORRHŒA BY PROLONGED INJECTIONS OF PROTARGOL.

WHEN so many new drugs are exploited before the profession, often for distinctly commercial reasons and on insufficient clinical data, we have reason to be conservative in accepting any one person's dictum in regard to the greater efficacy of a new preparation. When, however, a man as well known for his careful scientific work as is Neisser, announces that he has had better, quicker, and more permanent results from the use of protargol in gonorrhœa than from any other single or combined remedies, this statement is worthy of serious attention and the drug should be given an extended trial.

Neisser prefaces his remarks on this comparatively new silver salt by some observations on irrigation treatment, which he characterises as difficult of execution, as no more efficacious than other methods in the large proportion of cases, and as likely to be attended by serious complications. With all these contentions those most experienced in irrigation will be inclined to disagree. Neisser himself acknowledges that in individual obstinate cases he employs this method. Hand injections, however, he characterises as simple and readily applied by the patient. The syringe should contain at least 2½ to 3½ drachms, and the physician must see that the patient understands precisely how the injection is made. The ideal medicament is one which will not be irritating to the mucous membrane, but will none the less act as a germicide upon the gonococci. He has tried silver nitrate, argentum, ichthyol, and oxycyanate of mercury, but far superior to all these he finds protargol. This contains 8·3 per cent. of silver.

It is a chemical combination of silver with proteid, and forms a yellowish, fine powder which is readily dissolved by being shaken with water. This solution is not precipitated by dilute sodium chloride or hydrochloric acid, hence it is likely to penetrate deeply into the tissue.

In solutions of one fourth to 1 per cent. argonin it is practically not irritating. A continuously acting application can be made, since there is no chemical combination by which the salt is decomposed. Long-continued application is particularly potent. This may be accomplished by single injections which are kept in the urethra for thirty minutes. The method of procedure is as follows :

First, search is made to determine whether gonococci are present, whether they are present in both the posterior and anterior urethra, and whether they are present in threads pressed out of the prostatic follicles. When these latter show gonococci, instillations are used. Injections are repeated thrice daily after urination. Twice the liquid is kept in the urethra for five minutes, the third time for thirty minutes. The more abundant the secretion the more frequent the injections. Shortly, often in a very few days, these prolonged injections can be discontinued, and finally two of the injections can be made of the ordinary astringents, such as 2½ per cent. suspensions of bismuth or of thioform or of xeroform, employing as a suspension medium water or boric acid solution, or one fourth per cent. zinc sulphate solution, or 20 per cent. glycerin.

The great convenience of the treatment lies in the fact that the patient is not compelled to keep up the applications for a long period, though it is not the rapidity but the permanence of the cure which should be our aim. Even when gonococci disappear in twenty-four to forty-eight hours the patient should be instructed to continue the prolonged injections once daily for a week.

Microscopic control must be continued throughout, and only after repeatedly negative microscopic findings is the treatment to be abandoned. The physician should be slow in discontinuing his treatment.

In the beginning one fourth per cent. solution should be employed. This should be increased in strength until one per cent. concentration is reached. In chronic cases the penetrating effect

of protargol is well demonstrated, but it will be usually necessary before cure is accomplished to produce an acute inflammation, preferably by means of argentamin injections from 1 : 4000 to 1 : 2000.

As a result of his experience in hospital and private practice Neisser states that he has never had from any other drug such rapid, satisfactory, and sure cures.

Goldenberg contributes an article which in the main confirms the favorable opinion of protargol expressed by Neisser. He states that the treatment is absolutely painless, and there is no evidence of local irritation. In some cases after the disappearance of the gonococci a slight discharge persisted, which subsided after the conjoined use of astringent injections.—*The Therapeutic Gazette*, March, 1898.

NOTES, ETC.

The Permeability of the Epidermis to Medication.

— W. Filehne, in the 'Berliner klinische Wochenschrift' of January 17th, 1898, has a very able paper entitled "The Permeability of the Human Epidermis to Solid and Liquid Substances." The author has experimented with various substances with a view to ascertaining their power of penetrating the epidermis, the glands, or that part they have to do in absorbing fluids or solids, being excluded. As watery solutions do not pass through, the epidermis must be looked upon as a membrane saturated with fat, and therefore capable of absorbing only such substances as can be dissolved in this medium. Filehne has given special attention to those substances where lanolin has been used as a vehicle. He has found that sodium chloride, potassium iodide, and arsenic are not soluble, nor is blue ointment. Corrosive sublimate, sulphur, lead oxide, and lead acetate are soluble in lanolin. Mercurial ointment, according to a microscopic examination of the skin after inunction, was found not to have been driven mechanically through the skin, the cells of the epidermis failing to show any mercury. Carbolic acid, chrysarobin, oils, and various organic substances were found soluble. It is only after the passage of these substances through the various layers of the epidermis that absorption takes place. The author states that the subject of absorption by the glands leaves a large field for investigation.

Medical Age, March 10th, 1898.

HOPMANN (' Münch. med. Wochenschr.,' January 18th, 1898) reports the case of a three-year-old girl brought on account of a loud rhythmic murmur in the left ear. The noise was said to have been a sequel of severe whooping-cough. The noise was distinctly audible at a distance of 10 cm. from the ear, or at night at a greater distance. With the stethoscope it was heard as a loud blowing sound synchronous with the systole of the heart, and was not heard over the heart, the other ear, or the great vessels. The only means of stopping it was by firm tamponade of the auditory canal.—*Pediatrics*, March, 1898.

The Treatment of Sarcoma and Carcinoma by Injections of mixed Toxins.

—By C. Mansell Moullin, M.D.Oxon., F.R.C.S., Surgeon and Lecturer on Surgery at the London Hospital; Examiner in Surgery at the University of Oxford. London, John Bale, Sons, and Danielsson, Limited (3s. 6d.).

The treatment of malignant disease is a subject of such great and ever present importance that Mr. Mansell Moullin's work is a welcome addition to our means of knowledge. The volume contains an extremely useful account of the results that the author has thus far obtained from the use of Coley's fluid in cases of malignant disease. A distinctly good feature in this publication is the addition of an appendix giving particulars of all those instances that Mr. Moullin has been able to find in which malignant growths have disappeared after attacks of erysipelas, and of some of the most important cases in which a similar result has followed the injection of the mixed toxins. There is no need to recommend this work ; it sufficiently recommends itself, as can be seen by a perusal of the author's conclusions, which are as follows :

(1) It cannot be denied that there is a considerable number of cases in which sarcomata, that had been given up as hopeless, often after repeated operations, have absolutely and entirely disappeared under this method of treatment. There

is no other method of treatment (except inoculation with the streptococcus of erysipelas itself) of which this can be said.

(2) Some of these cases have remained free from recurrence for upwards of three years, the period which in the case of excision of the breast for scirrhus is regarded by many operators as justifying the use of the term cured.

(3) Several of the cases in which sarcomata have disappeared after an attack of erysipelas have remained free from recurrence for seven years and upwards.

(4) The fact that there may be a few—a very few—cases recorded in which sarcomata have disappeared, either spontaneously or after such diseases as acute specific fevers, has nothing to do with these conclusions. (The statement that sarcomata do occasionally disappear is repeated with great regularity, but well-authenticated cases in which this has taken place, verified in the way in which Dr. Coley's have been verified, are very difficult to find.)

(5) Nor are the conclusions in any way invalidated by the fact that injections of the mixed toxins are sometimes followed by the disappearance of other growths, such as lupus, keloid, syphilitic deposits, carcinomata, &c. It may make the disappearance of sarcomata more difficult to understand, but it in no way disproves it.

(6) The proportion of cases of sarcomata that are cured by the injection of the mixed toxins depends, among other things, upon the histological character of the growths. Spindle-celled sarcomata are by far the most successful. This suggests the conclusion that the mixed toxins have a selective action, even if it is not specific.

(7) The disappearance of sarcomata is not due to inflammation, but to an intensely rapid form of fatty degeneration, comparable only to that which affects the hepatic cells in acute yellow atrophy of the liver. Inflammation and sloughing, when they do occur, are septic complications.

(8) Degeneration and absorption may occur, whether the toxins are injected directly into the tumours or into some distant part of the body. In the former case, however, the constitutional symptoms are more severe and the effect more rapid.

(9) The method is attended by a considerable degree of danger. It should therefore only be adopted in those cases in which there is no other

remedy. The chief risk appears to be from collapse and pyæmia. There must always be danger of the latter if there is a suppurating or a sloughing sore. It may be argued that patients whose lives are immediately threatened by a malignant growth will never be cured by any remedy that does not involve some degree of risk.

(10) The toxins are of no use unless the cultures are taken from a virulent case of erysipelas, or are made virulent by passing the streptococcus through rabbits.

(11) The *Bacillus prodigiosus*, in spite of theoretical objections, has the effect of immensely increasing the reaction.

(12) The effect is most striking in the case of rapidly growing sarcomata. Slowly growing ones appear to have much more resistance. Probably this merely means that masses of embryonic cells with little organisation, give way to injurious influences more readily than those that are more closely knit together.

(13) Patients often gain in weight and strength while under treatment.

(14) Treatment should be continued until the whole growth has vanished, or has become so small that it can be removed.

(15) If there is a recrudescence of the disease, it does not follow that the toxins will be as efficacious the second time as they were the first. Whether this is the result of tolerance being established cannot be said.

(16) Growths of a similar character may spring up in other parts of the body after many years.

(17) The severity of the reaction is very variable. Probably this depends upon the rapidity with which the injection·is absorbed, rather than upon any cumulative action it may possess.

The disappearance of the growths is not the result of the high temperature. High temperatures due to other causes, such as specific fevers, are not followed by this result.

Coley suggests that injections of the mixed toxins may be useful in preventing recurrence after sarcomata have been removed by operation.

Incidentally it may be mentioned that injections of the streptococcus of erysipelas apparently never cause suppuration. If, therefore, the streptococcus of erysipelas is identical with the streptococcus *pyogenes*, the name of the latter had better be changed.

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* Specially reported for The Clinical Journal. Revised by the Author.

NOTICE.

A CLINICAL LECTURE DELIVERED AT GUY'S HOSPITAL,

March 2nd, 1898, by

C. H. GOLDING-BIRD, B.A.Lond., M.B., F.R.C.S.,

Surgeon to the Hospital, &c.

GENTLEMEN,—When you and I were in the physiological department I fancy we did not think much of white fibrous tissue. I remember that I did not; I thought it was a very inert material, and that a piece of string would have done just as well. It had not even the respectable elasticity of yellow fibrous tissue. But when I began to study pathology I altered my opinion, as I think you must have already done if you originally entertained the same idea as I did. I should say it is about the cruellest tissue in the human body; and whilst it is of very low vitality it has at the same time a cowardly property of shrinking, and it shrinks until it gets a tight grip, and then there is no pain so agonizing as that which it causes. I think I shall show you that the pain of scirrhus itself is probably almost entirely due to the grip of fibrous tissue. I shall now proceed to abuse white fibrous tissue as roundly as I can from a purely clinical aspect, and then I will see what good I can say for it. You may not recognise fibrous tissue as such in the pathological department, because, like many other evil entities in this world, it sails under aliases. Some of its aliases are scar, cicatrix, cheloid; or when it wants to be very aristocratic it calls itself adhesions. But it is always the same thing. It may occur either superficially or deep. The public are familiar with scars on the surface, but you must always remember that after, for instance, ruptured kidney or liver it is this same tissue which heals it up. When on the surface it by-and-by takes the place of the tissue that has been lost, for it needs some solution of continuity of tissue before you can get an ordinary traumatic scar. A scar on the surface is covered with epithelium, but deep in the tissues you may have a scar without an

epithelial covering. It comes to this, that I think fibrous tissue is the price we have paid for being such highly developed individuals. The lobster can make a new claw, the pigeon can make a piece of brain which has been lost—man can make white fibrous tissue. Man can also, it is true, make a few odd nerve-fibres and muscle-fibres, so histologists tell us, but the latter at any rate are not worth anything in practical life. The fact that we can make bone is no exception to this, for after all bone is nothing but calcified fibrous tissue. You may say that I should not speak of repair as a pathological process, because it is physiological; true, but you may overdo that, as I shall give you instances presently, and then at once white fibrous tissue becomes harmful. In studying this matter of scars to-day, I shall adhere to the clinical aspect of the question. One thing I want you to remember is that white fibrous tissue is very poor tissue; it is badly supplied with blood, though fairly supplied with lymph, and when once it is injured it does not quickly repair like a vascular tissue. Secondly, I want you to bear in mind that it has a very powerful shrinkage. I think the word "shrinkage" is a more apt term than contractility, for it seems to be almost a purely physical hardening action.

To put before you in a few words the life history of a scar I will instance the case of a burn. Here is a child eight years of age who came in in December last for a burn, and went out in January; and comes in for a second time now. Before the first visit the child was playing with matches, when the pinafore caught fire, blazed up and burnt the child on the neck and under the chin. These children sometimes get burnt under the arm-pit and on the hand in the same way. In these cases, if more than a mere vesication, we have presently a raw surface covered with granulation tissue; then this granulation tissue is converted into white fibrous tissue, and finally comes a layer of epithelium and the wound is healed. Now the longer such a wound is irritated by septic matter or other means, the greater will be the proportion of white fibrous tissue in the scar. In every septic case we get a large amount of scar tissue formed, which fact we have to bear in mind in treatment. Hence you find we are particular to get these burns as aseptic as possible, and as free from irritation as we can get them, even if for no other reason than that

there shall be as small a quantity as possible of this objectionable tissue about which I am speaking. On this granulating surface in our patient a Thiersch's graft was put. This is done to hasten cicatrization, and to ensure as little irritation on the raw surface as possible, and that is why it was employed in this little child's case. You are aware that to make a Thiersch's graft we take a razor and shave off a large piece of epidermis and lay this on the granulating surface; and thus by hastening healing and getting less fibrous tissue, we have less subsequent distortion by shrinkage to fear, for no sooner is fibrous tissue formed in the body than it contracts. This may not matter very much in certain situations in the body, but in others it matters very much indeed. Some of you have seen children in whom a scar has been allowed full play, and as a consequence the chin and face have been drawn down into the position of almost wry-neck; I have even seen a child's lower jaw so distorted that the teeth projected horizontally. A scar on the cheek may draw the eye down. You may get such a scar on the arm and chest that the arm will be drawn down and so fixed that the child cannot raise it from the body. To overcome the tendency of contraction in all these cases we employ grafting. We will now suppose that the child I have been mentioning has been treated without grafting, and that a large scar has resulted. In the course of weeks or months the child may be brought back with the chin drawn in the way I have described, or if burnt on the hand it may come back with the fingers flexed or fixed towards the palm. You may say you can treat it by stretching the scar tissue, but if you do so it will most certainly go back to its original position, the same shrinkage will reassert itself times out of number; stretching is not a lasting treatment. Or you may say, "Nothing is easier than to treat this case by dividing the scar; here is a child with the fingers drawn down; nothing easier than to divide the fibrous bands across." I reply, nothing easier but nothing worse; because this scar tissue, as I have said, is very bad tissue for repair, and a large open wound in such tissue would take a long time to heal, and when it does heal it will fill up just as it did before, and you are no better off.

Another element in these cases, especially where the arm-pit is involved, is where the scar tissue drags upon and displaces important struc-

tures. I remember Mr. Bryant alluding to a case some years ago in which distortion produced by scar tissue in the arm-pit was so extensive that had a knife been inserted into it to divide it—as seemed tempting to do in this particular case,— branches of the brachial plexus that had been drawn out of their course must have been severed. My advice to you is, "Never divide a scar if you can help it." How, then, are we to treat cases of this sort? We treat them on the same principle as you treat a sailing-boat when the wind overfills the sails,—that is, let go the sheet. For there is an insertion as well as an origin to every cicatrix, which ramify into the skin around, and take firm hold. The plan then is to make a V-incision into the healthy skin at one or both attachments of the cicatrix, and dissect them back; or I may put it in other words and say, dissect up the insertion or the origin of the scar.

So much for the general clinical history of a scar. We will now consider special instances. First of all, what is a surgeon's behaviour in regard to scars? Suppose he is operating, he has to think of what form the scar will be, what its shrinkage is likely to amount to, and the probable value of its vitality. An injury, of course, may leave him no choice; he has to take the scar as he finds it, and in such cases he cannot be much to blame if he leaves a scar which is detrimental to the patient. Let me give you as an example of choice of scar a case which you must have seen often at the out-patient department, namely, a nævus just below a child's eye. How are you to treat it? You may say that you can underpin it. If you do so you will draw down the eye and get ectropion. If you excise it you will get the lower lid still pulled down; yet you can treat such a nævus without getting any deformity. Recognising that scar tissue shrinks, you plan to cheat it, and provided you keep up a sufficiently strong and constant pull against the scar tissue you can generally master it; but the pull must be constant. It is done in this way: with the fine electric cautery stab the skin round without touching the nævus, keeping one eighth of an inch from it all round. Each puncture should be one eighth of an inch from its neighbour, and enter the subcutaneous tissue. If you go completely round in this way you will raise up a fortification against circumferential growth, and begin your cure.

Now do not be tempted to do any more than this on the first occasion. Let these punctures heal, and then you will find the child comes to you in a fortnight presenting little white spots all round the nævus; and if you look carefully you will see each little spot radiating at the edges and dragging upon the nævus, with the result that the nævus is becoming anæmic circumferentially. Then you repeat the previous operation further in, it may be two or three times, with a sufficient interval between; but only do a little at a time, and do it methodically. A nævus just below the eye treated in that way will never cause ectropion. If you burn too much at a time you get a slough, and thus you defeat your object and have to do some plastic operation. The explanation is simple: the small amount of scar formed each time is capable of being, and of being kept stretched by the orbicularis muscle, whereas any large amount of scar tissue introduced by burning away more than I have described at a sitting, will by its shrinkage overcome the muscular pull, and ectropion will result. You may say, why not dissect out the nævus and put in a skin graft? I take exception to the word "skin" graft, because what you graft is epithelium and not skin, unless you do a deliberate plastic operation; and the ordinary "skin" graft may lessen the subsequent contraction, but will not do away with it altogether. So if you want to prevent subsequent contraction it is not wise to depend on epitheliation, which is a better way than skin grafting, because it only partially prevents the formation of scar tissue.

Take another case which comes very frequently in out-patient work, viz. the chronic ulcer. Have you ever followed the course of one of these "out-patient ulcers," as they are called? A woman comes with varicose veins on the inner side of her leg, and a characteristic ulcer. She says it has not existed long. You treat it with applications and tell her to rest. She comes week after week, and you congratulate yourself because it begins rapidly to heal and new epithelium or "skin" begins to form. Perhaps it goes on until you have half to three quarters of an inch of new skin, as you call it, all round. Then, though the treatment is the same and the woman is better in health, we will suppose the healing begins to be very slow; you go on with the same treatment but the ulcer does not respond, the rate of healing now running inversely as the

time. Now pass your finger round its edge, and you will find that the ulcer is surrounded by a perfect ring of white fibrous tissue that has been gradually forming ; and now you have an ulcer with a hard margin, almost impervious to blood, and unless you do something to that edge you will scarcely ever cure your patient. You must often have noticed the thick callous edges that such old septic ulcers exhibit ; and the explanation of the slow healing is that repair will not take place at the edge because of the fibrous tissue which is strangulating the ulcer. An old treatment was with the scalpel to score the edge of the ulcer the whole way round. Directly one did that the fibrous tissue yielded, blood came along these cuts, and the ulcer began to heal. But if you put such a case to bed you can treat it by less heroic means, and get the edge very much softened, and the same result will follow. Here is another thing which the surgeon has to remember in regard to cicatrices. Suppose he is amputating ; you know the vessels tend to retract when they are cut, but nerves do not ; and unless he deliberately cuts the nerves short at the time he will very likely get one or more united in the scar, and when it subsequently shrinks the pain will quite invalid his patient, and further operation to give relief will be required.

Further, in amputating, the surgeon must keep in mind the poor vitality of a scar. In amputation, especially of the lower extremity, you know the rule is that you must never get a scar over the end of a bone. Why? Because owing to the poor vitality of the scar tissue it will be a source of annoyance, because the patient cannot bear his weight upon the part, and in cold weather it may become ulcerated. That is why we are particularly careful to adopt some form of operation which results in a good fleshy flap at the end, with the scar well at one side. Let me point out to you another necessary precaution if you are amputating the little finger of the right hand at or above the metacarpo-phalangeal joint — a precaution not always borne in mind. If you amputate that finger like the others the result will certainly be that presently the scar will get drawn towards the ulnar edge, and when the patient comes again to use his hand for writing the scar will travel over the paper and quickly become abraded. Therefore let the free flap be long, so that the scar may be well against the ring finger. Always have in mind

the protection of a scar from possible injury and from cold, because these parts, where fibrous tissue has formed, are very apt to be the seat of chilblains. There is often a burning pain in a cicatrix; and the stump of a limb that has been amputated some patients find as good as a barometer, because the pain varies with changes in the weather. Then there is the æsthetic side to this question of scar, which becomes of importance especially in operations on the fair sex. Such patients desire that you shall make a small scar, a neat one, and if possible put it out of sight. As an instance I might mention that if you have to remove an adenoma of the breast, it is very often possible to push the adenoma some distance from its apparent seat, and you can then bring it out and make your scar on the under side of the breast. Again, in operating high in the neck, never make an horizontal incision ; if you do the patient goes through life stamped as one who has attempted suicide. I remember seeing a young adult not long ago in whom such an incision was made for removal of glands in the neck, and as soon as I saw the patient the idea of suicide at once entered my mind. The old depressed and hideous scars on the neck from suppurating tubercular glands, and which stamped the bearer of them as " scrofulous " are now things of the past, but Adams devised an operation for raising and effacing them, so serious a defect were they.

Having spoken of what the surgeon's relations to the scar are, let me quickly run over what may be called the harmful side of scars which we see in practice. The harmfulness of scar tissue will depend on one of two things, its power of shrinkage or its low vitality. Thus a man tries to commit suicide by swallowing hydrochloric acid, and comes to you afterwards with dysphagia. He has scar tissue in his œsophagus, and that contracts, hence the dysphagia. Or the acid may have burnt his pylorus, and his pylorus contracts. The intestine has been known to be contracted by the scar resulting from the use of Murphy's button. There is no doubt that you save a patient the risk of an annular stricture if you can do without a Murphy's button. So also in tubercular or other ulceration of the rectum a cicatrix is left, which you must afterwards treat by dilatation or other means. A parallel instance may be found in the case of a man falling across a rail and injuring his urethra,

the resulting scar contracting and producing a traumatic stricture. Inflammatory stricture of the urethra, though due to no wound, is due to fibrous tissue nevertheless, and carries out its characteristic contraction. All these I have mentioned are examples of annular strictures of the mucous tubes of the body, and they all have to be treated, either directly or indirectly. The usual treatment is to stretch them as far as possible, slowly or rapidly; and whilst sometimes you have to go to the length of operating on them, you cannot operate on these cases on the same lines as on a cicatrix, say, following a burn on the neck, and you have no alternative but to score the ring of fibrous tissue in the same way as I spoke of scoring the edge of an ulcer. But the result will be that the patient sooner or later relapses. You may split, dilate, or divide a traumatic stricture, but the patient will come back again for relief almost as regularly as he pays his quarter's rent! Therefore you cannot talk of curing your patient in that way, and we may fairly say that such traumatic cases are incurable. Such a patient can keep himself in fair condition by learning how to pass instruments for himself periodically, but he must continue to do so. Sometimes the alternative which we have to adopt is an operation which does not interfere with the scar at all, but puts the patient in a better functional position. In the case of the urethra we have to divert the water current by a supra-pubic puncture or a Cock's operation; in the case of contraction of the œsophagus we have to perform gastrostomy, and do a colotomy in the case of stricture of the rectum. Therefore we are comparatively powerless in dealing with scar-shrinkage in the mucous tubes of the body. In the case of the urethra which has not received any injury it is equally true, as I have just said, that it is the white fibrous tissue resulting from organisation of lymph effusion which is causing the trouble. A man has gonorrhœa, and the inflammation of the mucous membrane spreads to the submucosa, which happens to be spongy tissue; it becomes inflamed, and what happens is practically a local phlebitis: he gets an inflammation of the cavernous blood-passages immediately round the urethra, as I can show you afterwards in a specimen on the table. Organisation takes place until he gets a stricture almost as hard as a piece of cartilage, and so you see it is possible to have

white fibrous tissue taking the place of normal tissue without a wound. I will give you another instance of the result of irritation and inflammation, which is of the nature of inflammatory "injury;" it is that of a man who has drunk spirits too freely, and has in consequence a cirrhosed liver. There you find white fibrous tissue; the alcohol has irritated his liver and produced a hypergrowth of "scar" tissue, hence the condition of things known as hobnailed liver. This reminds me of another and terrible disease due neither to injury nor inflammation, but which exhibits one of the worst forms of fibrous tissue contraction that I know of; I refer to scirrhous cancer. Its structure consists of a large proportion of epithelial cells, but the bulk of the tumour is made up of white fibrous tissue. Your patient comes to you and says "This cannot be cancer in my breast, because I have no pain." But let her wait a little, and there will be very distressing and acute pain when the growth begins to shrink; she will then tell you that it resembles a clawing and burning, both of which are pains complained of in some scars and cheloid to which I will refer presently. I would point out to you that people with softer kind of cancer do not complain of pain so much as those with the hard form or scirrhus, and this, I believe, is because in the softer forms there is not so much fibrous tissue. Where you find the growth running along the lymphatics of the skin of the chest, I need scarcely say the patient dies in great agony from the cuirass-like grip of this disease; but again it is fibrous tissue which is in my opinion mainly, if not entirely, answerable for it.

Even when the surgeon has successfully—as far as we can honestly use that word—operated for carcinoma of the breast, fibrous tissue still gives in many cases infinite trouble, from the fact that the scar that remains where the flaps cannot be united is then adherent to the chest walls beneath, and liable to crack under any extra movement of the arm. This we try to avoid by largely undercutting the surrounding skin at the operation, and so we are able to slide flaps from a long distance over the raw area resulting from removal of the breast. Here we get no cicatrix, as we practically perform a plastic operation—a better plan than putting on a Thiersch's graft, which leaves the scar only a few degrees better than if we had left the wound to cicatrise alone.

Let us now see what scar tissue does under the name of adhesions. Suppose a case of intestinal obstruction from a band, where does that band come from? Frequently the answer is that it comes from the peritonitis. But does the peritonitis make the band? No; peritonitis glues one part of the intestine to another, the band comes as a result of constant stretching of the fibrous adhesion, so that while it is true that a band does not come as the immediate result of the peritonitis, yet these adhesions constitute another example of the harmfulness of white fibrous tissue. You may, too, have a universal adhesion of every coil of gut in the abdomen, which gives rise to life-long invalidism, such as may arise after tubercular peritonitis in the young; or more commonly it may come after a peritonitis due to appendicitis. Everything may adhere to everything else, and the patient may live a life of pain and discomfort and constipation. We can do nothing with these cases; therefore adhesions are matters which are to be by no means thought lightly of. Occasionally after peritonitis adhesions will give pain, and their division may be called for. A young woman had her appendix removed by a surgeon on account of appendicitis. I saw her four or five months afterwards, and she was still in apparently the same pain. I had twice before seen similar cases, so I reopened the original wound and found two peritoneal adhesions going across the cæcum, which had grooved it so that it looked like a double hour-glass. I divided the adhesions or bands, and thus freed the bowel; the pain vanished, and she is now perfectly well. But it is not often you can come so readily upon the adhesion which is producing the pain. So, again, in traumatic pleurisy, through a broken rib; such a patient often has constant pain because he gets a pleuritic adhesion. If you stand behind such a patient with a hand on each side of his chest and tell him to breathe, you can easily detect any difference in the expansion movement of the two sides, such as pleuritic adhesions give rise to. A case happened to me a fortnight ago in which there was an action for damages on account of injury to the chest months before, and the history, coupled with the detection of adhesions in this manner, left no doubt as to its genuine character.

Adhesions in joints you are all familiar with, but I would draw your attention to one fracture-dislocation, namely, Pott's fracture. For some reason or other which I am not able to fathom the whole invalidism following Pott's fracture is attributed to the fact that the ends of the broken fibula are not exactly end to end, a thing which matters not in the slightest degree. But if you only remember Pott's original description of the accident you will see that it is white fibrous tissue that is to blame. Pott not only described his fracture as a fracture of the fibula and the internal malleolus, but he laid stress on the fact that the capsule of the ankle-joint was torn, and that there was much blood in the joint, and extravasated around. In treating a Pott's fracture we generally put it up carefully after reduction in plaster of Paris for a long time, and we are too timid in telling patients to walk. But the truth is that after the fracture adhesions have formed in the joint and around, and besides stiffness there is often the intense burning pain which is associated with white fibrous tissue. The patient says he cannot walk, and in nine cases out of ten he is told to walk when the pain has gone, and if that is adhered to he will never walk at all. But if we begin passive movement about the fourteenth day, and supplement that with a massage at regular intervals, we shall hear of no further trouble or pain after Pott's fracture.

But after all, gentlemen, the case against white fibrous tissue is not quite so black as my foregoing remarks may have led you to think; there is something good to be said about it. Thus fibrous tissue is of use to us in union of certain fractures. You may say "you do not want to get such tissue." But sometimes we have to make the best of a bad job. In fracture of the patella we now-a-days try to get bony union by wiring the patella. Of course this practice is not universal, and I should not recommend a man to do it unless he were a skilled operator.

The non-operative treatment is, as you know, to approximate the broken fragments as closely as possible, knowing well that fibrous tissue will form, and on it the patient in future must depend. But lest this union should unduly stretch you have to considerably restrain all movements for very many months, whereas a case of wired patella can walk in five weeks without any support. So there is ample justification in avoiding a fibrous union if it can be done.

Again, we often rely on fibrous tissue bringing about union in an intra-capsular fracture of the hip, where there is a bad blood supply; if we do not get such a union we may get none at all. A fibrous union, again, is all-important in a case of resection of the elbow-joint; there is an instance of that in Lazarus Ward now. We have excised this patient's joint for tubercular disease. It is a desperately bad case, and I had to take away a large quantity of bone; but by putting his arm at first into a straight splint and then moving the union after ten days, we have obtained a good fibrous junction; and this has been bent and stretched systematically, and we are now getting a very passable joint. By this process young people will sometimes get a joint which it is very difficult to distinguish from a normal one.

Again, the surgeon makes use of the shrinkage of scar tissue in the radical cure of hernia, though I admit it was of more importance in the old operations of Wood and Wutzer than perhaps in the more modern methods, in which an alteration in the direction of pressure from within is aimed at rather than the establishment of a fibrous barrier which is likely to yield sooner or later.

In operating for piles, and for prolapse of the rectum, the subsequent bracing up of the mucous membrane, whereby permanency of cure is ensured, is entirely due to the formation and subsequent shrinkage of the scar tissue that results from the cautery wounds that are made.

In opening a suppurating gall-bladder or an abdominal abscess, we at times have purposely to invoke the aid of adhesions in order to prevent the escape of pus into the general peritoneum; we do this by cutting down on the abscess and then plugging the wound with iodoform gauze; and when in a few days adhesions have formed, we deal with safety with the abscess itself. I can give you an instance of where the surgeon finds it of use to play off the shrinkage of one scar against that of another to the patient's benefit. You know in simple harelip that a tendency exists after operation for the resulting scar of contraction to produce after a time a notch in the edge of the lip. Various plans are resorted to to avoid this; but Mirault's plan of making one lateral flap, and transplanting it from one edge of the cleft to the margin of the lip on the other side, vivified to receive it, not only adds tissue, but causes the scar

to become shaped like the letter L, with the result that the vertical contraction of the one part tending to produce a notch is counteracted by the horizontal contraction of the other part.

Time, gentlemen, only permits me to refer to the pathology of fibrous tissue. Thus it is subject to atrophy; hence the gradual disappearance, more or less, of scars, and hence also the surgeon's disappointment when he has been relying on the contraction of the scar he has produced by his operation for the lasting cure of his patient. We see this markedly at times in the traumatic herniæ resulting from scars in the abdominal walls. Yet on the whole this atrophy of scars in the long run is in the main beneficial, and so constant is it that it might be stated as a general law that scar tissue tends always to lessen by atrophy.

Scar tissue, again, at times, and for reasons that we do not know, immensely hypertrophies, forming cheloid. Alibert described both an idiopathic and traumatic form of this; but the local or circumscribed idiopathic variety usually goes by the name of Addison's cheloid.

With the idiopathic diffuse forms, as sclerodermia morphœa, &c., I am not concerned. Surgeon practically have to deal with those only of traumatic origin, and all that we know on this subject is that cheloid seems more likely to occur where a wound has been irritated by septic or other causes, than where it has been carefully guarded from irritation.

Traumatic cheloid is more common in the dark than light races; and I lately saw a most marked case in an English officer wounded in a bush fight in Central Africa, against natives who purposely cut their faces into tribal and fancy patterns, as the wounds are certain to become extensively cheloid. Did any local influence, bacterial or otherwise, produce the cheloid in the Englishman? His wounds were with native bullets, and healed very rapidly, but at once began to thicken; and four months later each scar of entrance and exit was as thick as half a walnut.

I have known a simple blister cause cheloid; the suppurative skin affections as acne, boils, tubercular ulcerations, are common precursors. The fibrous tumour (cheloid) seen sometimes in the lobe of the ear after piercing for ear-rings, is figured in most text-books; and if you should ever be called upon to remove such a one, or indeed

any other form of cheloid, remember that though nothing but white fibrous tissue, the persistence with which they will recur after removal almost puts them in the category of malignant growths. There is less reason for touching them than might appear at first, if you but remember that the universal law above mentioned applies to them also; they tend always to atrophy, only they may take years about it.

Closely allied, if not identical with cheloid are the bulbous endings to cut nerves with which you are all familiar, and which will at times re-form very persistently after removal; and I might add Dupuytren's contraction, with thickening of the palmar fascia, as an example of circumscribed idiopathic cheloid, though not usually regarded as such.   .

I can now but name other pathological changes of scar tissue to which it is liable, whether or not it has first passed through the cheloid condition. The principal of these is undoubtedly epithelioma, seen now and then attacking the cicatrix of an amputation; then we have abrasions, eczema, and chilblains. Lately we have had in my wards a woman of middle life who presented a condition that in my experience was unique. A few months ago she fell, striking the buttock; a small hæmatoma (apparently) formed, that continued to slowly increase till when we saw her there was a stony hard adherent tumour between the muscle and the skin. Variously diagnosed as fibroma and even scirrhus, it turned out to be a fibroma (cheloid?) studded with tubercle.

Erb's Tonic Pills.—The 'Gazette hebdomadaire de médecine et de chirurgie' for February 6th cites the following formula from the 'Revue internationale de thérapeutique:'

R Iron lactate   ...   from 45 to 75 grains.
   Aqueous extract of cinchona ... 75   „
   Alcoholic extract of nux vomica
                    from 6 to 9   „
   Extract of gentian   ...   ... a sufficiency.

M. Divide into a hundred pills. One or two to be taken three times a day, after meals.

These pills are used in the treatment of tabes, after a mercurial course. Erb thinks that they not only ameliorate the patient's general condition, but even exert an influence on his psychical state.

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A DEMONSTRATION OF SURGICAL CASES

At the Charing Cross Hospital,

BY

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Acute Necrosis of the Tibia with unusual Results.

GENTLEMEN,—This boy's case is very interesting. He is now fourteen years of age. He was first under my care between February, 1892, and June, 1893. The history then given was that he was supposed to have had rheumatic fever, during which most of the joints of his body had been affected. He was very ill indeed, and developed a bad sacral bedsore, which led to his being kept more or less constantly on his right side. His mother said that all the joints in his body had been affected except his hips; but when he got up from this attack of "rheumatic fever," as it was called, he could not walk, and his friends then came to see that there was something the matter with his hips and that all his other joints were sound. During this illness, we were told, abscesses had formed and burst in the right leg. On exposing the right leg I found a number of sinuses leading down to bare bone, and there could be no doubt that here the mistake had been made, which is occasionally made, of taking a pyæmic affection of the joints, secondary to acute necrosis, for acute rheumatism. The history, therefore, if we translate it into proper language, is that he had acute necrosis of the right tibia, which came on after a blow received in December, 1891. Pus was allowed to burrow and burst through the skin without interference; much of the bone had been bathed in pus and had necrosed, and several widely separated sinuses remained over the inner aspect of the tibia. In addition to these we found bony anchylosis of the right hip in a position of flexion, abduction, and rotation outwards, while the left hip was dislocated on to the dorsum ilii. How could this be accounted for? Presumably a nonpurulent inflammation of both hip-joints occurred, due to infection from the tibia. You remember that during his illness the boy developed a sacral

bedsore, and was kept constantly on his right side, probably tending somewhat towards the back. Now in this position you will notice that the right hip would naturally be flexed, abducted, and rotated out, and the inflammation fixed it in this attitude. The left thigh would fall over the other that the knee might rest on the bed, the hip would be flexed, abducted, and rotated in, the head would press constantly against the back of the capsule; and I take it that in consequence of pyæmic effusion into his left hip, thus distending and softening the capsule, the weight of the limb had been able to lever the head out of the socket. He was an utter cripple; I am not sure that he could even stand; certainly he could not walk. I felt that there was very considerable danger in doing an open operation so long as he had suppurating sinuses leading down to dead bone in his tibia, from which micro-organisms were doubtless entering the blood in unusual numbers. Therefore I first split open the tibia from top to bottom, and removed the central portion of the shaft of the tibia. The epiphyses were not affected, and you notice that, owing to the prolonged inflammatory hyperæmia of the part the right tibia is half an inch longer, and the right leg more hairy than the left. As soon as the deep groove in the tibia had healed—and it took many weeks—I forced the right hip into the straight position, correcting the anchylosis under chloroform manually and without much difficulty. The result was very singular. An abscess developed beneath the anterior superior spine, and I naturally supposed it communicated with the joint or fracture. You see here the old scar and the stitch marks of the incision through which I cleaned it out; but I could find no communication with the joint, although the pus was subfascial. The abscess got well, the position of the hip was improved, and some movement in the joint appeared. I then turned my attention to the left limb, and made a determined attempt to put the head back into the socket by means of open operation. I found the head lying on the dorsum ilii. I could not replace it in the acetabulum, but succeeded in getting the head below the anterior superior spine and the Y-ligament, which is a position giving a good functional result. I could not, however, straighten the hip in this position. I hoped that the moderate flexion left would disappear soon under

the weight of the limb; and it did so, but apparently by yielding of the Y-ligament. The hip on this side was consequently insecure, and yields in walking much as it does after excision. The right limb promised to be strong.

I lost sight of the patient for some time, but he turned up again recently with the right hip (in which some movement was restored by the early treatment) flexed to about 40°; it was also somewhat adducted. When he stood there was great compensatory lordosis. Obviously a limb in such a position could not be used effectively, and it was the stronger of the two limbs. He was anxious to have anything done that might improve his condition, so I suggested that I should try to put the right limb straight by a subtrochanteric osteotomy. At the operation, however, I thought I would see what division of soft parts would do before attacking the bone. I divided the adductor longus tendon, the fascia, and numerous bands of adductor muscle-fibres with a view to overcoming the adduction, but it had little effect. I then opened up the old scar and divided the sartorius, tensor fasciæ femoris, ilio-tibial band, and the rectus femoris; but all this led to disappointingly little result. So I turned the boy over and made an incision on to his femur just below the trochanters, passed an osteotome on to the bone, and chiselled through it; so that directly I put my hand on it, it snapped with very little force, and the limb came down straight. The lordosis is now very slight; but the dislocation of the left hip requires a certain amount of lordosis to enable him to lie with the left leg flat on the bed. We are now waiting for firm union, when I hope that the lad will have very decided movement in the joint, that he will be able to sit comfortably, and to walk much better with his leg directly under him than he could when it was flexed at 40°.

The whole operation, which was pretty extensive, caused very slight disturbance of temperature, as you will see from the chart. On the evening of the operation, when he had come round from the anæsthetic, he was quite comfortable, and he had no pain, until a very curious thing happened which I have never seen before. On the twelfth day after the operation, when the wounds were quite healed, the boy was found crying on account of pain in the upper part of his thigh. The house

surgeon found that a swelling had formed in the adductor region whch extended from the pubes halfway down his thigh; at the same time the temperature was a little raised—99·5°. The house surgeon, thinking that the swelling was inflammatory, made a short incision starting from the small scar of my tenotomy puncture, and let out a quantity of clot, followed by venous and finally by bright blood. The source of this he could not see through the small wound that he made. He plugged the wound with a long strip of iodoform gauze, and applied a firm bandage over it; that stopped the hæmorrhage. When told of the occurrence next day I was naturally apprehensive lest so large a cavity might have been infected. I at once removed the gauze; there was no further hæmorrhage, the sides of the wound and cavity fell together, and it healed up again without the least difficulty under a cyanide dressing. But an accident such as this, involving a wound close up to the scroto-femoral angle, leading to a large cavity among the muscles of the thigh, exposed the boy to the possibility of infection, which, if it had led to suppuration in the large cavity which I have described, would have been a very grave matter.

Hæmorrhage occurring after such a long interval is very unusual. I do not know what could have brought it on. The boy is an excellent patient; he lies very quiet, and both his legs and trunk are fixed by sheets and sand-bags. Moreover, we did not cut any large vessel in the operation such as would be likely to be disturbed by movement on the boy's part.

Note.—This patient left after ten weeks with firm union of the divided femur. He was able to bear some weight on the limb, which was vertical when he stood, to bend the hip through some 15°, and to sit with comfort.

Ununited Fracture of the Tibia in a Child.

This child has come in very recently, and I have not seen the parents or ascertained from them full particulars of the history. The age of the child is three, and thirteen months ago he fell off a step and broke his right tibia and probably the fibula also. He was taken into Great Ormond Street Children's Hospital, where the limb was put up in plaster of Paris and the patient was sent out again. I do not know how long the plaster was

kept on; but when it was taken off and the patient was allowed to bear weight on the limb, it soon bent. He was taken to another hospital, where the leg was straightened manually, union being evidently anything but firm. He was then put up in splints, which he wore for a long time. When the splints were removed, the limb again bent. I do not know the further history, but you can see that the limb is now very markedly bent. At first sight, before I had asked any questions, I thought the bending was due to rickets. Had that been the case I should demur against doing any operation, because I do not believe in putting a limb straight when the cause of the bending persists. As a rule, I like to have evidence that the general disease has disappeared, and that the curvature of the bone is not increasing, before I agree to do an osteotomy for rickets. But my eye then fell on the other limb, which was perfectly straight; it is not likely that only one tibia would be curved so markedly as a result of rickets. Moreover there is no evidence of rickets about the child; the ribs are not beaded, the epiphyses are not enlarged, and so forth. On examination you will find that there has been a fracture between the lower fourth and upper three fourths of the tibia, and that only fibrous union has resulted. What are the causes of this state of matters? First there are the general causes. Anything which depresses the general health, whatever it is, may prevent union of bones; therefore one should go over a child very carefully, and find whether there has been or is any illness which may account for the non-union. One may allude to one or two disorders which have that effect: first there are starvation and exposure, which often go together; they have been found to account for non-union again and again in people inhabiting besieged cities, but as soon as the nutrition is improved the fractures have healed in the usual way. Syphilis is another cause of non-union, perhaps by producing a gumma in the fractured ends. Another cause is impairment of innervation, such, for instance, as in locomotor ataxy. The effect of the nervous system upon fractures is still one which must be regarded as *sub judice*. In a dozen cases of lesions of the spinal cord at and below the twelfth dorsal vertebra, collected in a Thèse de Paris, the fractures failed to unite; whereas in other cases in the same collection, in which

the lesion was higher than the twelfth dorsal, the fractures did unite. The author was therefore inclined to suppose that there was a special nutritive centre connected with the lower limb in the lumbar enlargement of the spinal cord. Objections may be raised to this view; one is that fractures in the lower animals artificially produced are said to unite more rapidly when the nerves of the part are divided than when the part is normal.

We find then that there are many local causes of non-union, of which the following are the chief:—First there is a compound fracture. I do not know why, but a compound fracture takes longer to unite than a simple fracture, even though the wound runs a thoroughly aseptic course. A compound fracture is not necessarily more severe than a simple fracture; the cut through the soft parts does not necessarily render the fracture more severe, but even with a slight puncture of the skin healing forthwith, the fracture will very likely take longer to unite than a simple fracture. Next, we have great obliquity of the fracture, leading to long sloping surfaces which slide one upon another, causing shortening, until the raw broken surfaces are no longer in contact with one another,—obviously not a favorable condition for union. Lack of contact between the fragments may be brought about by rotatory and other forms of displacement. Coupled with this it is very likely that soft parts will slip in between the surfaces, and all sorts of tissues have been found here; for instance, you may find pieces of muscle, tendon, or even nerve between the surfaces. The opinion used to be held that these soft tissues being wedged in between two hard surfaces would rapidly atrophy, but as a matter of fact they do not, and after even ten years recognisable pieces of tissue have been found between two fragments which have failed to unite. It is probable that there is some local cause for non-union in the case before us, for the fibula seems to have united whilst the tibia failed to do so. Local causes must play the chief part in the non-union of some fractures, especially when there is more than one fracture, and all except one heal kindly. In this present instance what I propose to do is to inquire carefully into the state of the child's health, and to endeavour to remedy any defect which may be discovered. I think it will be advisable after the

twelve or thirteen months' enforced rest of the limb to massage it thoroughly, in order to improve its circulation and nutrition. Treatment by plaster of Paris, adopted in the first instance in this case, causes absolute rest of the part, and prevents all contractions of the muscles, and consequently the rush of blood to the part which accompanies such contractions; this too perfect rest may have had something to do with the non-union. If we get no result from the treatment I have mentioned (and we probably shall not), we shall cut down upon the fracture to remove any materials which may be between the ends of the bone, to refresh them and place them in apposition, the fibula being re-fractured if necessary. Of course I shall adopt some means to keep the bones in contact. For instance, a piece of sterilised ivory may be driven into the medullary cavity of each fragment, forming a central peg; or I may find that the best thing is to put a wire or a screw through the fragments. So soon as the wound has healed, I should endeavour to keep up a certain amount of massage and exercise of the limb, as I think this will give the best chance for union. For, seeing that thirteen months have elapsed since this fracture took place, the nutrition of the limb is not favorable; and if we add to this that non-union in a young child, in whom the regenerative processes should be at their highest, is always of bad prognosis, we must admit that this is a case in which success may not attend our best endeavours. Before operating I shall have a radiogram taken so that I can study the form and relations of the bone-ends beforehand.

Tubercle in Mid-life.

This man of middle age (45) is the subject of chronic tubercular disease, and the history of the affection dates back several years, beginning in 1879. I use the case to show you how very difficult it is for an adult of middle age to throw off tubercle when once it has got firm hold of him. In 1879 he struck his left knee with a spade; the knee swelled up, and he had to rest the limb for four months, and then to take a six months' holiday. Probably this was a tubercular trouble. His knee seems to have remained well until 1883, when as he was walking the joint suddenly gave way, and remained so weak and tender that he had to support it with a back splint, which he wore

until 1886. About this date he took an unusually long walk, and more swelling and pain began in the joint. The limb was then more completely fixed in a starched bandage. He began walking, again, wearing this splint until 1888, when he was able to revert to the back splint. He was still wearing the back splint when I saw him here in 1894; so you may take it as certain that the part had not been really normal from 1888 to 1894, but the resistance of the man's tissues was high and the tubercular bacillus did not make much headway. He was admitted here in March, 1894, saying that six months earlier he had been walking with the back splint on when he tripped over a stone. He took little notice of this at the time, but a fortnight later he had more pain and inflammation. Doubtless the slight strain injured and depressed some of the tissues, and fresh growth of tubercle resulted. Patients will often be unable to ascribe any cause for a tubercular trouble; but if asked whether they knocked or strained the part they will admit that they did, but will add that it was three weeks or a month before the symptoms arose. We know that that is because the tubercle bacillus is of slow growth. Well, this man's pain and swelling were increasing, the pain getting so bad as to prevent sleep. He had had a Thomas's splint applied by his doctor, but that gave no relief, so he came to the hospital. I found that he was strong and well-nourished, that his left knee was hugely swollen, but no softening or abscess was evident; the joint was fixed in the extended position, and on attempting flexion great pain was caused. In March, 1894, I explored the joint by the usual flap incision, and found that the synovial membrane was softening, that there were several foci of disease. Against the opinion of most of my colleagues I did a complete excision of the knee. My colleagues thought the case very unpromising because of the general obstinacy of tubercular disease beginning in a man of his time of life, because the man was undoubtedly alcoholic, and because excisions do not always unite in people at or past middle life. Nevertheless I was very keen on preserving the limb, and felt that if I removed the tubercle completely by excision, the prognosis as regards recurrence would be quite as good as after amputation. Asepis would avoid the prolonged suppuration which followed upon excisions in former days,

and I hoped that firm union would be obtained. I found extensive disease of both bones and of the soft parts. After cutting a good slice off the surface of the tibia, I still had to use a gouge at several spots, and hollow out the surface to get rid of the disease. The patella was removed. Both deep and superficial wounds were sutured, the latter being covered with a collodion scab. The limb was fixed on a Thomas's splint and considerably raised from the bed. Absolutely no trouble ensued; the wound healed by first intention, and in a month he left the hospital wearing a Thomas's splint. As time went on it became clear that I had not secured bony, but only firm fibrous union. You may ask, was it worth doing? I think the patient will tell you it was. With light leather case having a steel rod up the back he was able to walk four or five miles with the aid of a stick only, and he continued able to do this for considerably over a year. At the end of eighteen months he met with an accident; he wanted to get between two posts at the same moment as did a big dog; they collided in the middle, the dog forced its way through, and the man's knee was strained, and soon after this a sinus formed on the outer side of the scar. I saw him again in May, 1896, when I opened the sinus and found a somewhat large cavity. This I scraped out freely and plugged with iodoform gauze, again fixing the limb on a Thomas's splint. But no real improvement resulted. The patient was developing other tubercular lesions, as I shall tell you in a moment, and I felt that it was not right to leave him with any focus of disease from which dissemination could be produced. I therefore told him that he would be wise to part with the limb; he consented, and I amputated it a short distance above the femoral condyles, obtaining complete healing in twelve days. I have no doubt from what I found in the part removed that this "recurrence" was really continued growth of a focus of disease in the tibia not removed at the first operation. The stump is not theoretically perfect, but it was the best I could obtain for him without shortening his limb unduly. I should have preferred throwing the scar further back. But it is not over the bone end, and you will find that it is perfectly moveable over the bone. I have no doubt but that he could bear a considerable weight upon the end of the stump.

I now show you the limb I ordered for him. It has the advantage of being reasonable in price, light, and satisfactory in make and action. It was introduced by Count Beaufort, and costs £5.

The next trouble which fell upon this patient— and which, rather than the sinus in his knee, brought him again to hospital—was tubercular disease of both testes. In September, 1895, he had noticed a swelling behind the left epididymis; it gave him no trouble, and he paid no attention to it. The left testis did not vary from that time until I saw him in May, 1896. But in December, 1895, he woke up suddenly one morning with an acute pain in the right testicle, which was swollen. He suffered considerable pain during the first few days, and a hydrocele formed. This was tapped, and some ounces of fluid were drawn off. Then it was found that he had a very much enlarged testicle, which was board-like in hardness. It was perfectly uniform and ovoid, the epididymis could not be felt, but the vas was twice as thick as on the left side. When I saw him an abscess was pointing through the skin, and on the left side there was a firm irregular mass just about the centre of the epididymis, moveable on the body of the testicle. The testicle was normal, and the vas was normal. What was the nature of this trouble? His medical attendant was puzzled. He knew the man had been a subject of tubercular disease; he suspected that this trouble was tubercular, but in most respects the right testis was unlike a tubercular testicle. Tubercular testicle is of slow, insidious onset, and gives very little pain in the earlier stages; whereas on the right side the onset was sudden, and pain and swelling were very acute; there was a large hydrocele, and an in-flammatory process in the body of the testicle. The epididymis could not be felt, because it was stretched out over the swollen body. So you see that in all these points this was as unlike a tubercular testicle as possible. The diagnosis rested chiefly upon three things. In the first place, the patient was a markedly tuber-cular subject; in the second place, the vas was decidedly thickened; lastly, the left testicle was affected, and it was clearly the seat of a tubercular epididymitis. Another point was that syphilis was absolutely denied; for the condition of the right testicle was like that resulting from syphilitic orchitis, except that the vas was thickened. The diagnosis, therefore, was probably a tubercular testicle of an unusual form affecting the body primarily and chiefly. We always have to bear possible exceptions in mind.

The man consented to the removal of the right testicle, so I made a clean sweep of the testicle, the abscess, and the skin over it, and by com-pletely opening up the inguinal canal I divided the vas just where it turns down into the pelvis. I next slit open the septum scroti, drew the left testicle out through the wound, and finding a chronic abscess in the epididymis, where the hard swelling was, I opened it freely and scraped it out thoroughly, applied 1 in 20 carbolic, and sewed up the cavity, the septum, and the superficial wound; the result has been satisfactory. You will feel now that there is very little thickening of the vas. Some surgeons have said that they have seen tubercle disappear after this mode of treatment, and that it is often unnecessary in tubercular epididymitis to castrate the patient. That I do not think has been proved. You have heard in connection with this case how long tubercle can exist; you have seen tubercular lesions apparently completely recover, and you have seen them relapse again, and until many years have gone by we do not know whether they have subsided for good. I remember a gentleman whose tubercular troubles commenced with a pleurisy at the age of sixteen. Very shortly afterwards he got an abscess of the left epi-didymis which burst and healed. Next a non-suppurating arthritis of the knee developed; then he got anterior caries of the dorso-lumbar spine, with some of the largest abscesses I ever saw. These were opened and drained antiseptically, and in three years all healed. Finally he developed at the age of twenty-five an abscess along his left spermatic cord, i.e. on the side of the former abscess in the testicle. Now I have always thought that if that testicle had been removed when he was sixteen, probably he would not have had an abscess along his cord at twenty-five. The abscess along the cord was operated on, and was not thought to present any danger to life, though it was found to extend far into his pelvis, and could not be completely removed. The same night this gentleman was so well that he was reading, and would not have a nurse in his room. Next morning I was fetched in a hurry. I found the patient

with his pupils dilated, so that the iris could hardly be seen, blanched, and almost pulseless; he thought it was dark, and recognised me only by my voice. He was in a state of extreme collapse, and died in a few hours. Post mortem we found that he had tubercular supra-renals, and it became practically certain that he had died in the first collapse of Addison's disease. The tubercle had spread from the spine to the supra-renals.

To return to the present patient. About two months ago he was suddenly seized with pains in the back, which were supposed to be due to cold; the case was treated accordingly, and the pain got a good deal better. One morning, about a fortnight ago, when he was getting up he discovered that there was a large lump on his left groin. This proved on examination to be an abscess, which having distended the iliac fossa had somewhat suddenly run down behind Poupart's ligament into the thigh—not an uncommon history in these cases. The abscess was treated last Saturday by thorough erasion and flushing through two wounds, one above Poupart's ligament and one in the thigh, where extensive burrowing among the adductors and backwards to the small trochanter was found to have occurred. The wounds were closed. Considerable accumulation of bloody fluid was let out by sinus forceps through the iliac wound, and we hope that now good union will occur. But even though recovery from this illness also should take place, with such a history in mind one cannot but wonder what will happen next.

An Ointment for Acute Articular Rheumatism.

—Lemoine ('Nord médical;' 'Tribune médicale,' February 9th) gives the following among other formulæ:

℞	Vaseline	...	...	...	25 parts.
	Salicylic acid	...	...	...	4 „
	Sodium salicylate	...	...	3 „
	Extract of belladonna	...	...	1 part.

M. To be applied and covered with cotton

An Application for Painful Ulcers of the Cervix Uteri.

—The 'Journal de médecine de Paris' for February 27th gives the following formula as Lutaud's:

℞	Tannin	...	...	...	...	4 parts.
	Lycopodium	...	...	...	10 „
	Europhene	...	...	...	20 „
	Compound powder of opium	...	1 part.

M. To be insufflated through a speculum and kept in place with a cotton tampon.

N. Y. Med. Journ.

MEETING OF THE SOCIETY OF ANÆSTHETISTS,

At 20 Hanover Square, February 17th, 1898.

The President, Dr. DUDLEY BUXTON, in the Chair.

Discussion on Dr. WALLER'S communication on

DOSAGE IN ANÆSTHETICS.

The PRESIDENT said he was sure every person in the room would feel that a distinct step forward had been made in that most important matter through the researches of Dr. Waller. Of course, what he had been able to give them that night was but a small fragment of the very important work which he had been conducting for some time, but it appeared to him that it brought the issue to almost within what he might speak of as a "grappling standpoint." There had been a great deal of talk, more or less abortive, and a great deal of paper had been spoiled over the question of whether or not the heart or the respiration failed first under chloroform administration. It had been pertinently said that the individual who was undergoing the process of being killed by chloroform cared little whether he was killed *quâ* the heart or *quâ* the respiration. Doctor Waller's remarks appeared to show that they might divest their minds of all apprehension upon the score of respiration or heart failure, provided they had impressed firmly upon their minds one fact—that a certain dose of chloroform would kill an individual, whether by the heart or the respiration, they need not for practical purposes concern themselves about (though from the point of view of resuscitation it became important), and that another dose would not kill him. Perhaps all of those present that evening would say there was nothing new about that, it was known by them when they entered the room, and that they had had it always in mind in everyday practice. No doubt that was to a great extent true. But many things were true in theory which they had not quite time to consider, and which were not so imbued in their minds as to become a part of themselves as they ought to be in carrying out the work of their lives. He was sure that the question of dosage in anæsthetics was only too often rather more a matter of theory than, as it ought to be, a

guiding principle in their work. He said that in great submission, because he had no doubt other speakers would tell him that he was speaking for himself and not for them, and he was quite prepared to hear that. As Doctor Waller had said, there was a very distinct gap between mastering the principle that dosage saved or dosage killed, and how to arrive at the middle course, how to keep themselves in the broad waters of safety, and avoid drifting in the shallow places of extreme danger or even death, was the difficulty.

Then as to the reports of cases by Dr. Carter of Weymouth, who gave his anæsthetic from a modified Junker's inhaler. Dr. Carter had given them his views in that room, and his experiences, and they were rather impressed by the fact that the dosage which Dr. Carter indulged in was the minimum, and although possibly an adequate dosage for the minor operations of surgery, was certainly not demonstrated to be adequate for the prolonged and hazardous operations which were dealt with in large hospital practice. That brought them to the consideration that, although undoubted value was attached to the study of the action of anæsthetics upon detached nerve—and personally he felt that they owed the greatest debt of gratitude to physiologists who were able to reduce such a complex problem to its most simple conditions,—yet it must be remembered that the problem which they had to confront in their daily work was a very much more difficult and complex one. It was comparatively easy to give a known percentage and influence a nerve, and produce anæsthesia or complete immobilisation of a nerve, but when they were dealing with individuals of different weights and of different vital powers, powers which they were not able to estimate; persons whose circulations, as well as their respirations, varied from the zenith to the nadir, the problem presented to them was very much more complicated. He thought what one had to think of was not only the question of dosage from the point of view of the nerve, but the dosage from the point of view of the intake and elimination; and the great problem had always appeared to him to estimate how much chloroform remained in the circulation, and how much was thrown out by exhalation. He was quite sure very many casualties occur not so much from undue intake as from diminished output of chloroform from the circulation, and any apparatus must fail them there, and in such cases only an increase of knowledge and increase of experience could help them. As he had said before in that room, there was no doubt that the man who commenced anæsthetics without a full and sufficient knowledge of physiology was a very dangerous individual. But they had to go beyond the standpoint of physiology, and consider the question from many sides. He thought it would be useful in the discussion, for he was simply there to invite them to take part in the discussion, not to confine themselves to the question, if he might be allowed the expression, of "localised dosage," but how they could obtain a dosage for the whole body from the point of view of intake and from that of alterations in the individual's physical condition influencing the output. This question appeared to him to be quite as important as that of regulating the amount of chloroform introduced into the circulation. He hoped every one present, whether visitor or member, would give them the benefit of his views and experience, speaking either from the side of physiology, or from that of practical acquaintance of the giving of chloroform and other anæsthetics.

Dr. J. Rose Bradford said, the President had asked him to attend and say a few words on the subject, but he must offer his apology to the Society, as he was not an anæsthetist, and it was more than ten years since he had administered an anæsthetic. He intended, therefore, only to speak from a physiological or pharmacological point of view. He would like to say that all physiologists and pharmacologists were indebted to Dr. Waller, not only for the ingenuity of his method, but also on account of the fact that it had given a precision to the subject which, as far as he knew, no other method had, of testing the action of anæsthetics. He thought they had seen the merit of that that evening in the very definite statements which Doctor Waller had been able to make with regard to suitable dosage.

As to the question raised by the President, he thought one must bear in mind that it mattered little what living tissue was selected for testing the action of anæsthetics. Although it might seem a little far-fetched to draw generalisations from the action of an anæsthetic on such a highly specialised structure as a nerve, yet when one considered the main results obtained by Dr. Waller (he did not say the details, because nobody had ever worked

out, so far as he knew, such details) as regards the differential action of ether and chloroform, he might remember that other workers had obtained somewhat similar results on other tissues, and more especially on the heart. He would like to ask Dr. Waller a question. He had given them very definite and accurate information as to the dosage and the danger limits, and he would like to ask Dr. Waller whether he had been able to find, in his observation on nerve, any difference in the results according to whether the percentage of the anæsthetic was gradually or suddenly increased. Many years ago, at the time when the controversy relative to the chloroform killing through the respiration or through the heart was occupying the attention of the medical profession, he (*i.e.* Dr. Bradford) did a number of experiments, having had a pretty considerable experience in connection with the action of anæsthetics on dogs, and he always thought there was a great deal of beating of the air in that controversy, because, speaking simply from his own experience in dogs, he would say that whether chloroform killed through the respiration or the circulation depended on how the anæsthetic was given. It was quite easy to kill a dog by asphyxia during chloroform administration provided it was given gradually; it was also easy to kill the animal with chloroform by cardiac syncope if it were given suddenly. An experiment which seemed to him to be very conclusive was that if they gave chloroform to a dog by a modified Junker apparatus (the apparatus used in the laboratory was practically a modified Junker), and gradually increased the amount of chloroform, the dog would be killed by asphyxia. If the thorax was then rapidly opened they would find the heart either still beating, or, if it had stopped, it could be excited again by ordinary mechanical or electrical stimulation. He believed that statement was true of all cases; it was correct in all cases as far as his own knowledge went, provided the asphyxia was induced in the manner stated. If, however, they took a dog and gave it chloroform in a box, the atmosphere of which was saturated with chloroform, or if they put a large amount of chloroform suddenly close to the snout, and so killed the dog suddenly, on then cutting open the thorax they would find the heart arrested, and it could not be made to contract by any stimulus either mechanical or electrical, its excitability was

permanently destroyed. It was an objection he made to Dr. Brunton at the time of the discussion, and it was one which he believed had never been met. It seemed to him that that showed conclusively that in the one case the action was on the heart, while in the other it was not. Further, Mr. Leonard Hill's observations had shown that chloroform had a decided effect in causing dilatation of the heart muscle, and this was probably another and more accurate way of observing the same fact. One would be very much interested to know whether, with the delicate method of investigating the question employed by Dr. Waller, any differentiation could be made in the results of merely gradual increase of dosage, from those in which the increase in the doses was very large and sudden. Another point was, that if they got a dog in a dangerous condition by giving gradually increasing doses of chloroform, it was the simplest thing in the world to recover the dog by artificial respiration; but if it was got into that condition by sudden large doses, his experience was that it was practically impossible to recover the animal by simple artificial respiration. In other words, this was impossible where the cardiac toxic effect had been produced.

Dr. WRIGHT said he had nothing to say upon the contribution of Doctor Waller, but would like to touch upon a remark made by Dr. Bradford as to recovering dogs after the effects of administration of chloroform in sudden as against gradually increasing doses. He had been writing upon methods of resuscitation, and the method he had employed was not the same as Dr. Bradford's. He took a handkerchief, tied it round the dog's mouth, and saturated it with chloroform, and kept it on until after the dog's respiration ceased. That he had done for a good many years, and he thought the heart was recoverable after the sudden administration of a large dose of anæsthetic; it was recoverable by the ordinary methods of artificial respiration; and that introduced the question, which was scarcely pertinent to the present discussion, of how to recover animals after they had had an overdose of chloroform. In nine cases out of ten an animal could be recovered by the following method. One went down rapidly for the carotid artery, cut it open, and then induced artificial respiration. He was led to do that by the following consideration : when chloroform was given

very rapidly the heart was stopped owing to the excess of chloroform. The position of affairs in the circulation then was that the blood which had gone on to the central nervous system and caused death contained an overdose of chloroform, that the blood in the left heart when the animal was dead contained an overdose of chloroform, but a larger dose than the blood in the arteries. The blood in the pulmonary veins contained a further excess of the drug. When artificial respiration was induced the worse blood was driven from the pulmonary vein into the left heart, therefore things would be made worse instead of better. Acting upon that, he cut the carotid in such cases, and thus provided a vent for the worse blood in the left heart and pulmonary veins. When that blood escaped, he took it that under such conditions the heart resumed its beats. Another thing which was brought about by that was to get the non-aërated blood which has accumulated in the left heart away, and they placed themselves at a mechanical advantage, because they had to force the blood out into arteries which were empty, but which could not be enlarged without a considerable amount of mechanical pressure behind. They now pressed out blood from the left heart into arteries which had no pressure in them, and by that means had avoided sending on that over-chloroform-charged blood. His experience was that there was no difference in killing animals by fast or slow increase of anæsthetisation, that in both cases respiration stopped before the heart stopped, but that in any case the heart recovered if they fed it again with properly aërated blood.

Dr. HEYWOOD SMITH said reference had been made to Junker's apparatus in which the air was blown through the chloroform, or whatever vapour was used. Before chloroform was discovered his father made an apparatus, in 1846, for administering ether; it was used afterwards for chloroform. The apparatus had the same principle as those now in use, but instead of having the air blown through the fluid it was drawn in by the patient in inspiration. It occurred to him that this would be a useful modification to carry out, because if the respiration began to alter, the amount of anæsthetic inhaled would likewise alter, i.e. as the breath became weaker the amount of anæsthetic inhaled would be smaller.

Mr. GRANT MORRIS said it seemed to him

as a practical anæsthetist, that while they all admired the beauty of Doctor Waller's experiments, and the accuracy of the dosage and the effects on nerve, the difficulty they had to face was that though they were willing to keep the strength down to 2 per cent. or under, every one engaged in the work knew that they might have two patients of exactly the same age, the same weight, and the same apparent vitality, but that the behaviour of one under the anæsthetic differed very much from that of the other for reasons which they did not know, and which could not be measured before the operation. The Junker apparatus acted very well indeed with a large number of patients, but at the same time there were patients on whom it was very difficult to produce the effect within a reasonable space of time. It seemed to him that they wanted a method as well as a theory, though he of course agreed with all Doctor Waller had said with regard to the necessity of accuracy in the quantities used.

Mr. BRAINE joined in the discussion.

Dr. COOK said he felt something like that operator who, while he knew no anatomy, was a most successful operator on cases of stone; but when he began to study anatomy he gave up in despair, and did no more operations. Up to the present time his (Dr. COOK's) experience had been similar to that of many others. He had given the A.C.E. mixture by the open method,—that is to say, using a leather mask which went by the name of Rendle's, pouring on about two drachms each time, and putting it over the face of the patient, and practically judging of the quantity needed by the effect produced on the patient. That inhalation was continued for periods of from one to even three hours, and after giving it two or three thousand times, no deaths had occurred. He would like to ask the President, as an exponent of practical anæsthesia, whether this was not an altogether unjustifiable method, and whether their immunity so far had really been more by luck than anything else, or, if they chose, luck tempered by experience. In other words, was not the pouring of chloroform on lint, or A.C.E. mixture by Rendle's inhaler, which allowed the ordinary air to be mixed with it, an unjustifiable method in the light of Doctor Waller's exact experiments, and the results obtained by him? Ought they not to discontinue such methods, and resort only to Junker's inhaler?

The PRESIDENT said he would like to ask Doctor Waller two questions, but before doing so he would say in reply to Dr. Cook's personal appeal that as it was said on a certain occasion, "Who made thee a judge over Israel?" he, the President, could not sit in judgment upon methods which others had seen fit to employ, nor could he go so far as to say whether or not any methods were unjustifiable. His own personal feeling was that any method which did not admit of exact or nearly exact dosage was faulty, and that faultiness would appeal to those who used it, sooner or later, in a most unpleasant way. One had also to remember that no less an authority than Lord Lister had stated that they did get an exact dosage by the employment of lint or a towel upon which chloroform was dropped, believing, as he (Lord Lister) did, that knowing the temperature of the air, and therefore the rate of evaporation, one could tell at what rate the anæsthetic was inhaled. Personally he thought the experiments from which that dictum was made were open to grave criticism.

The questions he desired to put to Doctor Waller were:—those who upheld chloroform as against ether were exceedingly prone to tell them that some people died under chloroform on the table, which was a deplorable circumstance, but could not be helped; but people who took ether died in their beds subsequently from the ether. One would very much like to know whether a series of experiments had been made by Doctor Waller, in which the detached nerve kept alive in the moist chamber as long as possible, had been repeatedly stimulated with currents, and at the same time had been repeatedly subjected to the vapour of anæsthetics, and whether after 100 or so excitations under an anæsthetic, the nerve which had been exposed to chloroform vapour behaved in the same respect as a nerve which had been exposed to an equivalent of ether vapour, or whether one nerve was in a worse condition than the other. He feared the answer would not absolutely close the question, but it appeared to him that experiments along those lines might help them to estimate how far effects were liable to be produced by one anæsthetic rather than by the other.

Personally he thought the cry about the after-effect of ether was a cuckoo cry based upon imperfect knowledge and insufficient data, and it was a statement which required further experimentation.

He would also like to ask what was the effect upon detached nerve of repeated administrations of chloroform vapour, simply given in *not* a lethal dose or a dose sufficient to produce complete immobilisation, but one which would simply put the nerve to sleep. If that was repeated time after time, at short intervals, did the nerve simply become exhausted, or did it die outright? Or had Doctor Waller ever noticed molecular change in the nerve brought about by the treatment by an anæsthetic?

Doctor WALLER, in replying to the discussion, said he would answer the last question first. The effect of equal physiological strengths of chloroform and ether were identical, bearing in mind that chloroform was physiologically about seven or eight times as powerful as ether. That was where the President's remark in opening came in very cogently. They were dealing with a complicated organism, and there came in the local effect of the ether. In his experiments it had come out that the ether gave the irritant stage far more prominently than in the case of chloroform on a nerve; he could not say more than that. He had put upon the screen records of four successive doses on the same live nerve, which was a two hours' experiment, and it was satisfactory to find living nerve could endure an experiment of that length of time. The two anæsthetics in equal strengths behaved in an exactly similar manner.

Regarding the President's opening remarks as to the elimination of chloroform, he was very much alive to that. If they obstructed respiration and went on pushing in chloroform they would overfill the reservoir and kill the patient. The optimum amount of chloroform, 300—600 c.c., was the balance of income and expenditure. But before they could take any details into account they must know what their income is. In regard to the remark that it was the percentage in the blood which it was necessary to arrive at, Doctor WALLER said that that could be readily found, because if the patient was breathing an atmosphere of chloroform at a given tension, the percentage of chloroform in the liquids of his body would correspond with that same tension. Admitting that air and fluid at body temperature can take up respectively half and one volume of chlo-

roform vapour, then 1 per cent. of the latter in the pulmonary air and 2 per cent. in the blood will be at the same tension, and therefore in equilibrium. The remark of one of the speakers showed an inadequate appreciation of what he (Doctor Waller) was pleading for as regarded dosage. By sucking the air through chloroform, instead of having it blown in, the patient might take six times as much as he ought to do (Dr. Waller explained by diagrams); the patient might suck into his lungs something approaching 100 c.c. of chloroform in one gasp, which would be madness. The aim of the Junker apparatus was to supply chloroform at

because it was a great presumption on his (Doctor Waller's) part to state, what had certainly been stated by the Edinburgh school, that death from chloroform was death by maladministration. Lord Lister stated at Liverpool—a statement which he (Doctor Waller) did not subscribe to—that chloroform was safer than ether. He could not imagine what data such a statement was based upon; they were entitled to ask for the data, because that was a weighty statement coming from Lord Lister.

In conclusion Doctor WALLER said he was much obliged for the opportunity of being present
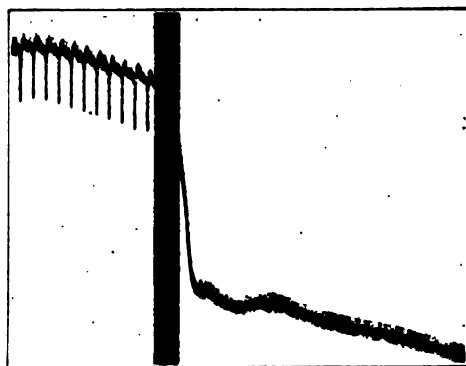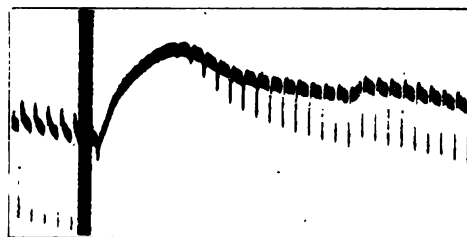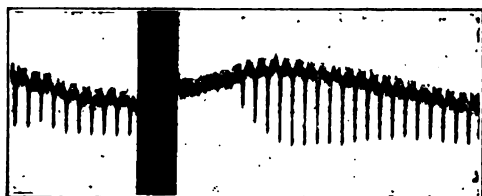
A.C.E. Mixture.   Three consecutive experiments on nerve.

the beginning of inspiration, and the patient had to be watched whether his respiration was deep or shallow.

With regard to the behaviour of A.C.E. mixture, he had three consecutive experiments which typically illustrated his experience of A.C.E. (Doctor Waller cast these upon the screen). A.C.E. was really a chloroform mixture, but it was one of which they were uncertain as regards the nerve. He did not know what was the result of its use on the human subject.

Referring to the allusion to Lord Lister, he wanted to partly cover himself behind Lord Lister,

and making the acquaintance of practical anæsthetists. He was most anxious to learn what was the general experience of practical anæsthetists. It had been a matter of presumption to plead with them for what they were probably well acquainted with, and he had learnt a good deal in a small way by the questions he had been asked that evening.

The PRESIDENT proposed a cordial vote of thanks to Doctor WALLER for his fascinating address and his most splendid demonstration of his views. The records as taken were put before them, and they were records which could not lie. Doctor WALLER had come with an absolutely un-

biassed mind, and showed that he held a brief for no side. What he had advanced he had put forward clearly, and moreover had furnished ample proof of. There was no attempt to bolster up a wrong cause ; he had attacked the question in the only really scientific manner.

THE USE OF LEECHES AS A THERAPEUTIC AGENT.

By J. T. McKAY, M.B.

THE following cases may prove of interest to your readers.

The first is a case of *membranous croup*, to which I was called. On examining the child I found well-marked membrane encircling the part and extending to the larynx and trachea. The glands of the neck were very much swollen. The pulse was 140, and very feeble. Respiration stridulous. The child clutched at her throat, and was very restless, throwing back her head occasionally. There was distinct anæmia and some bronchitis, the urine being scanty and albuminous. The distress in breathing being very great, large doses of ipecacuanha were administered, the throat being tickled with feathers ; at the same time a bronchitis kettle was kept in action, and patient nourished with small quantities of brandy and milk. The child rapidly growing worse, I had recourse to a leech, which was placed on the neck with salutary effects. In three hours after application the breathing and throat difficulty improved,—child had been previously poulticed,—and she ultimately recovered, though tracheotomy was at one time almost resorted to.

Another case of severe erysipelas occurs to my recollection, where a patient with this complaint, accompanied by œdema, laryngitis, and almost at death's door, was suddenly bettered by the application of leeches. I may say that this patient was anæmic and suffered from mitral disease.

I will only take another example of the usefulness of this old and too often neglected remedy now-a-days, in the case of a man who had fallen from a great height, and suffered from concussion of the brain (two days unconscious) coupled with pneumonia. Two leeches were applied to each temple, and the patient, aided by this, made a good

recovery, the pneumonia meanwhile being treated with the ordinary remedies.

I certainly can testify to the great value of leeches in certain cases, and hope they will still retain a place in the general practitioner's *rôle* of treatment.

NOTES, ETC.

Chronic Vaginal Gonorrhœa.—In a very thorough article, Dr. Bodenstein (" On the Existence and Therapy of Chronic Vaginal Gonorrhœa," 'Deutsche medicinische Wochenschrift,' 1897, No. 42) states that primary gonorrhœa of the urethra in women is rare ; the primary infection is usually localised in the posterior vaginal vault, the urethra being secondarily infected by the discharge. As a means of microscopically proving hidden cases of gonorrhœa, Bodenstein advises thorough tamponade of the vagina, in both the anterior and posterior fornices, with cotton dipped in a 10 per cent. ichthyol-glycerin solution. Through the dilatation thus effected, and by the hygroscopic properties of the glycerin, the gonococci—which the writer believes are situated in the subepithelial connective tissue—are brought to the surface, and hence may be examined. If in this manner the diagnosis of gonorrhœal infection is made, the ulcerated and at times bleeding spots are touched with a 2, 5, or 10 per cent. argentic-nitrate solution. Strong bleeding may be stopped by tamponade, The most favorable time for this treatment is either shortly before or shortly after menstruation. Cases complicated by subacute inflammation of the adnexa are first to be treated with ichthyol tampons. Bodenstein is of the opinion that the ordinary vaginal irrigation, as practised, cleanses but slightly the posterior vaginal wall. Hence he advises that air be allowed to enter the vagina during irrigation, and more thorough cleansing will result.—*Medical Record*, March 19th, 1898.

An Antiseptic Powder for Suppurating Surfaces.—The 'Gazette hebdomadaire de médecine et de chirurgie' for February 17th gives the following as Schwartz's formula :—Powdered iodoform, powdered salol, bismuth subnitrate, powdered charcoal, powdered cinchona, powdered benzoin, equal parts.

THE CLINICAL JOURNAL.

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NOTICE.

THE SURGICAL AFFECTIONS OF THE STOMACH, AND THEIR TREATMENT.

A Course of Lectures delivered at University College during February, 1898, by

ARTHUR E. BARKER, F.R.C.S.Eng., F.R.C.S.I., &c.;

Professor of the Principles and Practice of Surgery, and Professor of Clinical Surgery at University College, and Surgeon to University College Hospital.

No. 1.

GENTLEMEN,—I mentioned to you, on the last day I saw you, that I should devote the next six or seven lectures to the study of the surgical affections of the stomach and their treatment, and try to make that inquiry as full as would be suitable for a course of ectures of the kind we are engaged on.

Before beginning the subject I should like to say that it has for a long time had special interest for me, and that I have lately been collecting as much of its literature as possible for my own study. The results of the latter I now propose to epitomise for your advantage, knowing that you cannot obtain much of the most recent information on the subject except from foreign publications, and feeling that it is a pity our students at University College should not have the benefit, as soon as possible, of work done abroad, as well as at home, so as to know what is going on in the surgical world.

It is a very remarkable fact, that while English physicians have always been to the front in the study of the pathology of gastric disease and its treatment, and have produced some of the best treatises we possess on the subject, surgeons have been relatively slow in developing the operative treatment of the organ, especially in London. In the provinces it has been otherwise, for reasons we need not go into, and more has been done relatively outside of than in London in this branch of our art. I do not know that we ought to reproach ourselves with that fact, because it is necessary to

proceed cautiously in all these new movements, and of course London is looked to by the empire to control the current of thought in all new matters.   The profession here has, therefore, been exceedingly cautious in relation to this subject. A remark made some years ago by a very distinguished American physician and surgeon at a meeting of one of our societies struck me very forcibly, namely, that while they across the Atlantic looked to Europe for a great deal of what was new

Now I must at once say that my own experience in this matter is relatively small.   I have operated on some eighteen or twenty cases of stomach disease, but that is as nothing compared to the importance of the subject.   I happened to have done the first successful gastro-enterostomy in this country twelve years ago, and that gave me a special interest in the matter ever since; but it is an illustration of the very small amount of work done here that in the interval no pylorectomies
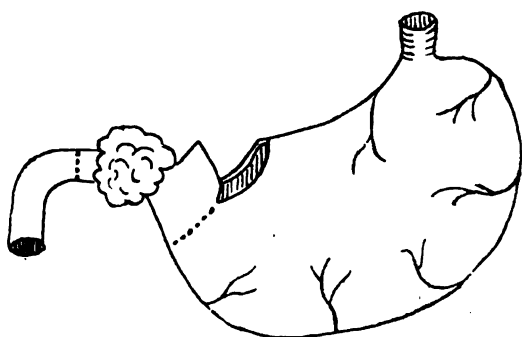
Fig. 1.—Pylorectomy.   1st stage.
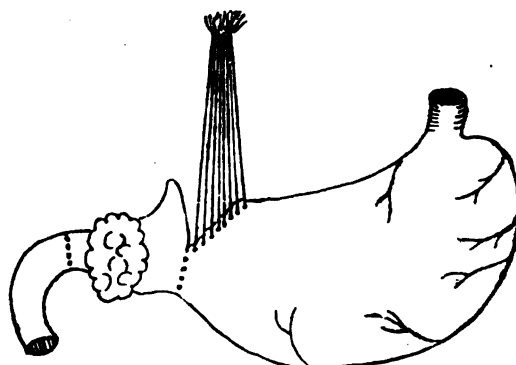
Fig. 2.—Pylorectomy.   2nd stage.
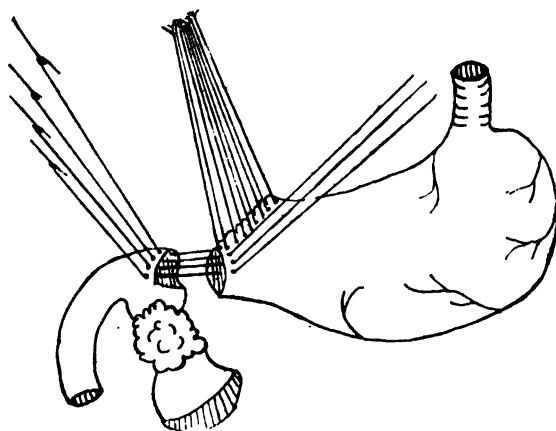
Fig. 3.—Pylorectomy.   3rd stage.
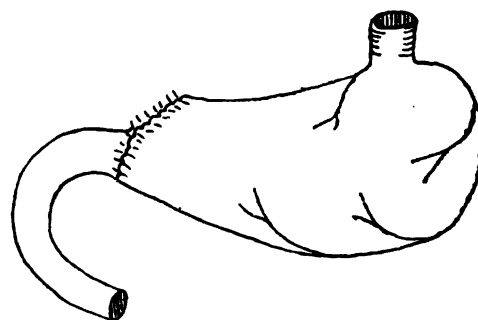
Fig. 4.—Pylorectomy.   4th stage.

in medical science, and for guidance, they were inclined to wait till it filtered through London, and that they were influenced a great deal by the opinions of those in London, who, with the enormous population which we have here, and the clinical experience derived therefrom, and keeping in touch with the views and needs of a very vast empire, would be likely to give a more dispassionate opinion upon the newer questions of medicine and surgery than anybody else.

have been done in our hospital, and only five gastro-enterostomies, all of which it appears have fallen to myself.   That will give you an idea of how slowly we move in this matter.   On that account I have been driven, in order to give you any comprehensive view of the subject, to avail myself largely of foreign publications; and while I shall not always stop to refer to the source of information from which I have drawn, I wish once for all to acknowledge frankly that a large part of

what I shall put before you is based upon a very suggestive essay of my friend Professor Mikulicz of Breslau, whose industry is only equalled by his immense skill as a surgeon. I have also availed myself of the experience of Dr. Doyen of Paris, and of the recent statistics, some of the latest and most valuable we possess, of Professor Carle of Turin. For the older statistics I have drawn largely upon a paper by Dr. Haberkant of Dantzig. Now it will be impossible, without being tedious, to mention all the sources besides of information drawn upon for the conclusions to be put before you, taken from publications here and there ; but I hope I have as frankly as possible admitted where my information comes from in the main.

the first lectures I shall merely aim at a review of the subject of gastric surgery as applied to malignant disease, in the subsequent ones we shall consider the non-malignant affections and their surgical treatment.

I particularly do not wish you to think that I am advocating this or that view of pathology, or this or that operative procedure. But it appears desirable that we should have certain facts and the experiences of others before us, and from these we shall be able to draw our own conclusions. I may suggest conclusions here and there in one way or another, but I do not wish to transgress this limitation which I have adopted, at all events for the

Fig. 5.—Woelfler's anterior gastroenterostomy.
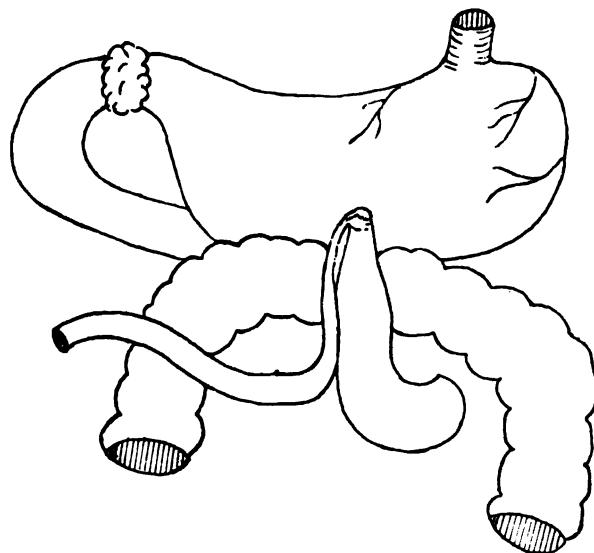
Fig. 5a.—Anterior gastroenterostomy (defective).

I will only add that in the matter of the literature of this empire and of America I have been immensely helped by an old pupil and my house surgeon elect, Mr. Leopold Goffe, to whom I tender my best thanks. He very kindly volunteered some months ago to collect anything that I wanted ; I therefore placed the English statistics in his hands, and he has put his shoulder to the collar and performed the task just as one would expect from him.

The subject of gastric surgery naturally divides itself into the consideration of those measures undertaken for the relief of malignant disease, and those designed to check or cure non-malignant affections.

I should like you clearly to understand that in

present, and really the matter hardly admits of more.

Now the gravity of the whole question is very great. We are dealing with one of the saddest diseases, to my mind, which can afflict a human being. To begin with, carcinoma of the stomach is most serious. The other affections of the stomach, including various forms of ulcer and pyloric stenosis, are very often dangerous in their consequences, but the cancerous affections are inevitably fatal in a relatively short time. These patients have either to face slow starvation, with death as a rule by asthenia, or they have to make up their mind to a very grave operation of one kind or another, and we ought to give our whole attention to the subject, and endeavour to form just and fair conclusions in

regard to it, because upon us rests the decision in a great many cases whether these patients' lives shall be cut short straight off, or prolonged ; and if prolonged, it will be for us to decide whether we are to aim at a measure of permanent relief or of mere palliation, or not.

Turning to the surgical affections as a whole of the stomach, it may be noted that not so long ago, some twenty years or so, all the morbid conditions of the organ were considered to be beyond the reach of surgery. But since then the operative treatment of this part has advanced by leaps and bounds, thanks to the teaching of one who, like yourselves, has sat upon those benches—I mean Lord Lister. The firstfruits of antiseptic surgery
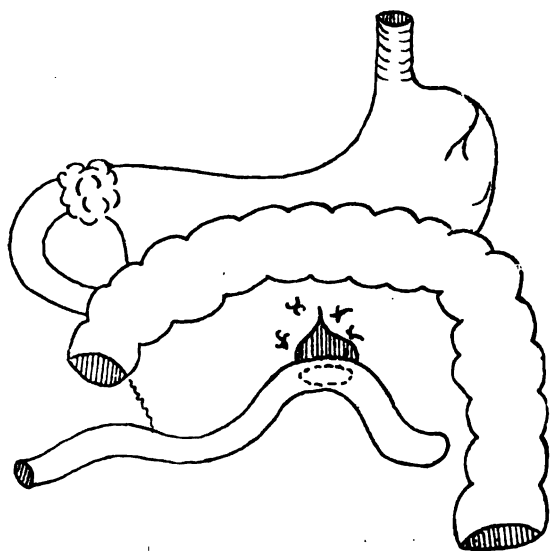
Fig. 6.—v. Hacker's posterior gastro-enterostomy.

in this field were seen in the treatment of injuries of the organ, such as stabs and bullet wounds, for which laparotomy was performed, in order that the wounds might be cleansed and closed. And very soon—as soon as people grasped the principles of antisepsis—the fruits of the procedure began to be abundant ; patients were saved from death from these injuries who had formerly been put aside to die as hopeless cases. Emboldened by the results of ovariotomy and other abdominal operations, surgeons began to open the abdomen when the stomach was injured by violence, and to examine the part affected, clean the wound, and close it. A certain measure of good fortune followed, and very soon success became greater and greater, until

now any surgeon who had to deal with a patient having a stab or other puncture in the stomach who did not open the abdomen at once, or as early as possible, would be looked upon as behind the times. Then foreign bodies, which had either formed in the stomach or had been swallowed, such as concretions or bezoar stones, began to be removed, and I can well remember the fuss which was made, even in the daily papers, about a case in one of the Paris hospitals in which a man swallowed a fork which he had been playing with to amuse his children, and how much excitement was caused by the attempts to remove it. And when I tell you that the process which was adopted in that case was that of producing an eschar over the stomach by caustics, and slowly eating through the abdominal wall to get into the stomach, after adhesion with the abdominal wall had taken place, you will see how far we have now progressed. I remember
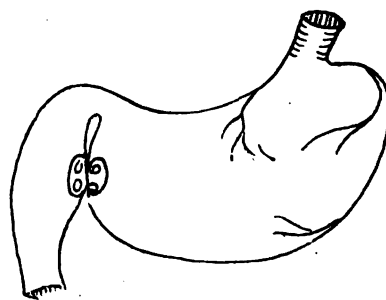
Fig. 6a.—Gastroduodenostomy.

these reports about *l'homme à la fourchette* being not only interesting, but rather amusing. But long before this speculations had been indulged in as to whether organic disease of the stomach might not be within the reach of the surgeon. The first seriously to propose that we could interfere in such a disease appears to have been Merrem of Giessen, who experimented by the removal of the pylorus in dogs, and published his views in a treatise as early as 1810, entitled 'Animadversiones quædam chirurgicæ experimentis in animalibus factis illustratæ.'

Merrem's dogs all died of his operation, and his views were considered no more than a dream until 1876. Then Gussenbauer, a very distinguished pupil of Billroth, since then his successor at Vienna, proved by experiments on dogs that not only could the operation be tolerated, but that the animals appeared to suffer no inconvenience from

the removal of the pylorus. A little later Kaiser confirmed these observations, and showed that excision of nearly the whole of the stomach could be performed without completely deranging the process of digestion. In his hands a more perfect antisepsis yielded much better results than in those of his predecessors. These experiences, proving as they did the tolerance of the stomach to antiseptic surgical interference, led to greater hopefulness in dealing with injuries, and some of the simpler morbid conditions of the organ, such as fistulæ, began to be dealt with, as well as stabs

subject was done by Billroth on the 29th January, 1881, and since then the operation has been recognised as a regular surgical procedure. In 1882 the first resections for ulcer of the stomach were done by Rydygier, followed by Czerny. Then Woelfler's operation of gastro-enterostomy followed closely upon that of pylorectomy in 1881. Since this we have had many additions to the formal operations on the stomach. I will put a table of these before you, and you will see that there is already quite a considerable list of gastric operations. Let me say in passing that I do not
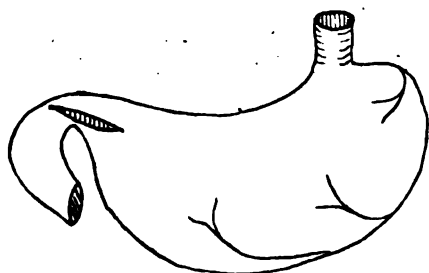
Fig. 7.—v. Heineke's pyloroplasty. 1st stage.
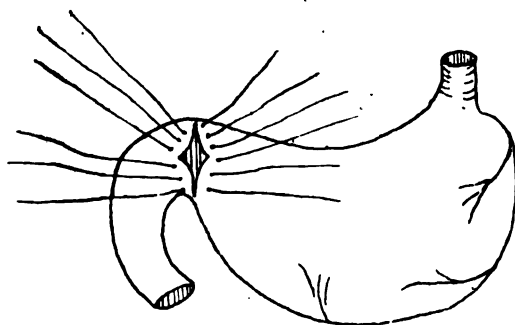
Fig. 8.—Pyloroplasty. 2nd stage.
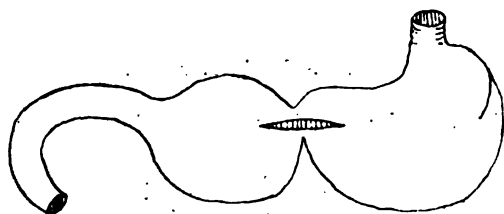
Fig. 9.—Gastroplasty. 1st stage.
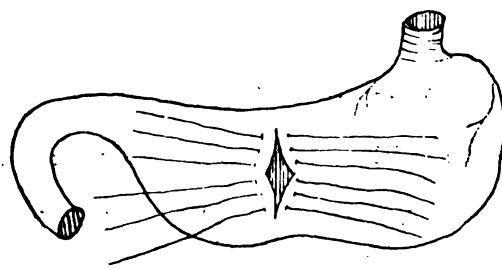
Fig. 10.—Gastroplasty. 2nd stage.

and gunshot wounds. In some of the cases so treated parts of the stomach were removed with the very best results; that is to say, where there had been ragged wounds, or extensive adhesions, or a rotten, inflamed stomach wall, portions of the latter were cut out, and the hole thus made was stitched. In 1879 the first pylorectomy on the human being was done by Péan, of Paris, whose death you will have noticed occurred within the last few days. This case was unsuccessful, as also was the second, done by Rydygier, who performed his in the following year.

The first successful pylorectomy on the human

suggest that you should burden your note-books with all the tables and statistics which I shall put before you in the course of these lectures; they are exhibited to show you at a glance what is being done: but figures which represent operations and their results to-day will probably be antiquated this time next year.

TABLE I.—OPERATIONS ON THE STOMACH.

Group 1.—For Malignant Disease.

Pylorectomy.

Gastro-enterostomy, anterior.

„   posterior.

Group 2.—For Non-malignant Disease.

Divulsion of pylorus (Loreta).

,,   modification by Hahn.

Pyloroplasty (v. Heinike).

Gastroplasty.

Gastrolysis.

Gastroplicatio.

Gastrostomy.

Gastro-anastomosis (Woelfler).

Gastroduodenostomy.

Gastrectomy.

Now I must give you a very brief sketch of the outlines of these operations,—that is to say, of their plan and the general purpose for which they are performed, otherwise my allusions to them will not be clear. If it is necessary later on I can enter into them more fully, and certainly the methods
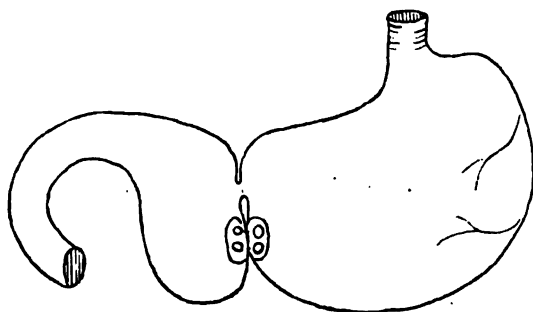
Fig. 11.—Woelfler's Gastro-anastomosis.

of suture will have to be gone into at greater length.

First of all, pylorectomy. The aim of this is to remove the pylorus with the ulcer or growth which is affecting it, and to adapt the end of the stomach to the first part of the duodenum, so as to bring about continuity of the tube. The operation I am describing is that designed and carried out by Billroth and his immediate successors, mostly his pupils. It was very well described as divided into four stages. In the first an incision, well on the proximal side of the affected part, is made from the lesser curve of the stomach downwards and halfway through the organ (Fig. 1), leaving the pylorus still attached to the greater curve. The next stage consists in what is called the occlusion suture (Fig. 2),—that is to say, that gap in the stomach is closed by a series of silk stitches, which we will consider afterwards, and which I have re-

presented in the figure as lines. All this has reduced the orifice of the stomach to about the size of the duodenum. In the third stage (Fig. 3) the incision through the end of the stomach is completed, and sutures are introduced between the half of the duodenum divided and the upper part of the reduced orifice in the stomach. All this time, of course, the aim has been to keep these parts as nearly in apposition as possible and to reduce the strain, and only to do the operation in steps so as to diminish the bleeding. In the fourth stage (Fig. 4) the end of the duodenum is completely divided, the stitches are drawn together which were previously inserted, and the rest of the stitches are introduced so as to bring the stomach and duodenum into perfect apposition, thus restoring the continuity of the tube. There are a great many matters more connected with this pro-
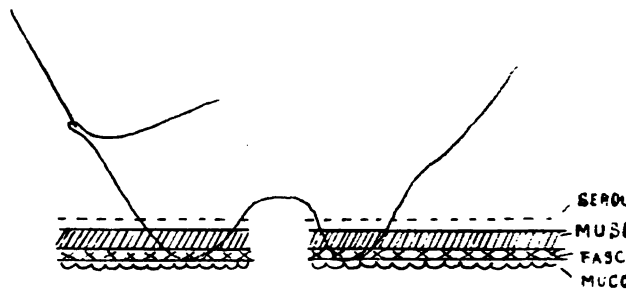
Fig. 12.—Lembert's suture.

cedure, which we shall have to consider further on if possible.

The next operation which I ask you to consider briefly is gastro-enterostomy. Of this there are two varieties. The first in historical order is that of Woelfler, also a distinguished pupil of Billroth, who helped him in his earlier operations, and had the benefit of the teaching of the master. It is represented in this slide. He did the operation in the first instance on the spur of the moment, where a growth in the pylorus had been found too extensive to remove. The question then arose whether something else should be tried, and this procedure was adoped and found to be successful. The first part of the jejunum was taken up, the omentum being drawn over to the right side and the colon being raised. The piece of small intestine, as I show you in this diagram (Fig. 5), was sought for as it made its escape from

under the mesocolon, and was turned up over the stomach. A hole was cut then in the latter and a corresponding aperture in the anterior part of the jejunum, and the two apertures were stitched one over the other. You will be able to see the defects of the operation as well as its good points from this drawing (Fig. 5A). I have interposed, as well as I could, the colon in the position it usually occupies. You see that in this case the colon would drag upon the small intestine. The ascending arm of the latter is nearly parallel to the descending arm, and as time went on it was found that these frequently became perfectly parallel, and united by adhesions, and then the escape from the stomach was just as much into the afferent portion of bowel as into the efferent. The consequence was that when the bile and pancreatic fluid passed downward, this afferent part became distended (Fig. 5a), and the obstruction
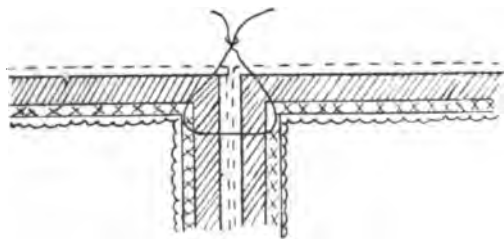
Fig. 13.—Lembert's suture closed.

in many cases destroyed the patient. That suggested another operation, which was designed by von Hacker, also a pupil of Billroth's, namely, gastro-enterostomy postica. Von Hacker's idea was that if you pulled up the colon and sought for the first part of the jejunum, and tore a hole in the transverse mesocolon, stitched the latter to the posterior wall of the stomach, the omentum being thrown upward, you could get the first part of the small intestine easily into contact with the stomach through that aperture, and unite it there. If that were done and were successful, the fluids from the stomach would gravitate naturally into the opening as I show you here (Fig. 6), and, as there was no drag from the colon on this loop, we should have the flux of the stomach contents in the direction of the efferent loop quite easily, and there would be less regurgitation into the stomach from the jejunum. That was successfully done, and is regarded by many now as the most desirable opera-

tion to perform in these cases. The reasons are that there has been less obstruction, harmless regurgitation, and no pressure upon the colon. In all these, you observe, the aim of the operator has been to place his loop in such a position that the peristaltic action of the small intestine should pass in the same direction as that of the stomach, that is from left to right, and von Hacker achieved that. But it is a difficult thing to make out in which direction really the bowel is passing. In my last operation, and one which turned out successfully, I found subsequently, the patient having died of another affection later on, that the direction of the bowel was reversed and that my loop went from right to left; it did not affect the case in the least, but still it was not right. Gastroduodenostomy (Fig. 6 a) is but a modification of Woelfler's operation, and very rarely applicable.

Then we come to divulsion of the pylorus, an
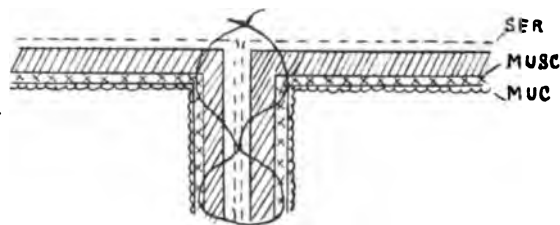
Fig. 14.—Gussenbauer's suture closed.

operation devised by Loreta in 1882, to relieve stenosis of the part. An opening was made in the narrow end of the stomach, and through this the finger was inserted into the contracted pylorus and made to stretch it; then two fingers, until it had been enlarged to a little more than its natural size. Hahn modified this later, in so far as he thrust in his finger, pushing the uninjured anterior stomach wall before it, and was thus able to enlarge the contracted outlet without opening the organ.

The next operation of which we have to consider the design is pyloroplasty. This procedure, devised by v. Heineke in 1886, began to be done when it was found that there were cases of pyloric stenosis which appeared hardly to justify the removal of the pylorus, but which nevertheless demanded some relief for the patient, and where the contraction was too obstinate to yield to divulsion. This consisted in making a longitudinal cut (Fig. 7) of eight centimetres (it must not be more

than ten) through the constricted portion of the pylorus. The edges of the resulting wound were then drawn apart, and what was originally the longitudinal slit was converted into a vertical opening. You see in Fig. 8 that the ends of the original incision now become the middle of the wound. That is the only point which requires very careful attention. The traction on these middle sutures, which really bear the whole strain, is very great, and the reason for making a fairly limited incision was that the strain would probably drag the stitches out and tear the wall if the cut were a large one.

The next operation was gastroplasty (Fig. 9). It was found that in a good many cases of chronic inflammation of the stomach the organ was converted into an hour-glass shape, with a very narrow opening into the pyloric antrum, so small indeed that the cardiac portion became dilated,
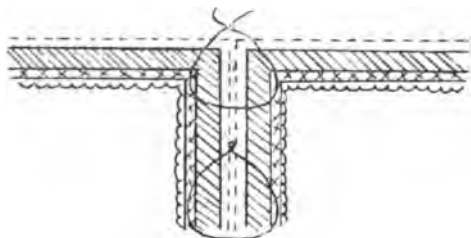
Fig. 15.—Czerny's suture.

whereas the other part of the stomach received no part of its contents. Some proposed gastro-enterostomy on the proximal side of the stricture in the stomach, and others the cutting out of the affected piece. But it occurred to those who had given attention to these conditions that an operation similar to pyloroplasty was the obvious thing to do. A longitudinal incision was made through this stricture, and it was drawn out vertically, the stomach being restored to its normal shape by suture in a vertical direction (Fig. 10), the incision having been originally in the long axis of the organ.

Another operation for the remedy of the same condition has been recently proposed and practised by Woelfler. This consists in uniting the two portions of the stomach below the stricture by an opening in each, and without interfering with the latter. This gastro-anastomosis, as it has been called, may be done by ordinary stitching or by Murphy's button (Fig. 11).

Then as to gastrolysis. This may now be considered a formal operation, and its purpose is as follows :—in many cases patients have been found to suffer from very severe gastralgia and other symptoms, to which I shall allude later; and it has been suspected that they have had gastric ulcer or carcinoma; but when the abdomen has been opened, it has been found that the stomach was merely adherent in various directions, without any organic disease like cancer or ulcer. Only scars of old ulcers and adhesions, which may have been responsible for the keeping up of the severe pain, were to be found. In this country I know Dr. Robert's has been noticing this condition for a great many years. He told me it was quite a strong point of his, this matter of stomach adhesions, and I have heard from others too that he has put the matter forward over and over again for many years past. It occurred to surgeons that
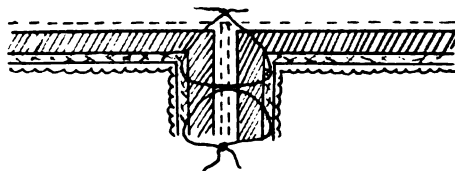
Fig. 16.—Woelfler's suture.

if these adhesions were removed, and the stomach were liberated from all the surrounding parts, the condition would be cured. That was found to be the case. It is this separation of the stomach from the surrounding adhesions which is the aim of the operation of gastrolysis.

As to gastroplicatio, it would be impossible to illustrate it properly by a drawing. I think it is an unscientific procedure, but it was suggested by the enormous dilatation of the stomach which was found in some cases of pyloric stenosis, or even without the latter, and it was thought that this secondary condition ought to be relieved by some operation short of attacking the pylorus. Now of course, if it was the pylorus which was at fault, it ought to have been operated upon. But for contraction of the pylorus I find it hard to understand how this operation would be of any use whatever. It simply consisted in folding the lower border of the enormously dilated organ over the front of the latter, and stitching it all round in this

position; that is to say, a tuck was taken in, and it was reduced to its ordinary size by being folded over, rolled together, and stitched up. As I have said, I think it is a very unscientific and undesirable proceeding, whether for pyloric stenosis or for gastric atony.

Gastrostomy, although included rightly in any list of the operations on the stomach, I shall not describe here, as it is designed to relieve œsophageal stenosis rather than any condition of the organ itself. Moreover I pass by gastrectomy, or excision of the whole stomach for cancer, although it has been successfully done. It appears to me rather a surgical feat than a true remedial measure. Its chief interest lies in the fact that its results appear to prove for the human subject what had already been shown for dogs, namely, that the stomach is not indispensable, physiologically, to proper nutrition.

I shall have to describe to you later in detail the sutures used in these different operations, so that
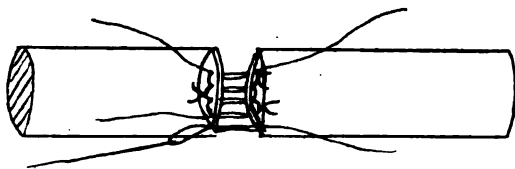
Fig. 17.—Bishop's suture.

I will now only place before you a brief outline of their varieties, as I shall probably have to revert to them by name frequently in what follows.

This is Lembert's suture (Fig. 12), so commonly used, which aims at bringing serous coat to serous coat. The needle is dipped at one side of the orifice, which has to be closed through both the peritoneal and muscular coat, and—please carefully remember this—rather deeply into the submucous coat, because there is a tough layer under the latter which holds better, and is less liable to tear than any of the others. The needle is then brought out through the same layers near the edge still of the serous coat. It is then dipped through the opposite serous coat on the other side of the opening, and takes the same course out again. In that way, when we draw on the thread, we fold in the ends thus (Fig. 13), and bring the serous coat in contact with the serous coat. That, of course, leaves a raw surface turned towards the

viscus which has been sutured. But it was found that occasionally when this mode of suture was adopted gastric juice and septic matter got in between the mucous coats and destroyed the union, and that led to various attempts at adaptation of the actual mucous surfaces; and we have first of all suggested by Gussenbauer a suture which goes by his name (Fig. 14). Gussenbauer adopted the Lembert principle, but he took a double dip with his needle through the coats, the second time coming out on the cut surface, between the mucous and muscular coats, and entering the opposite edge in the same situation, so that when the threads were drawn upon these two surfaces would be brought round against one another, and the chink between the mucous edges would be closed (Fig. 14). It is, as you see, very complicated; for this reason it has been modified by Czerny, who did the same thing with two sutures (Fig. 15). His is an important and valuable method. He stitched the two mucous edges together as you see here, cut his knot short, and then sutured the serous and

Fig. 18.—Bishop's suture in section.

muscular coats by a second row as I show you, either an interrupted suture or a continuous being employed in the latter case. But that knot between the serous surfaces was an offence to some people, so that Woelfler modified the method further in this way, namely, by putting the knot inside (Fig. 16). You can stitch two-thirds or four-fifths round any of these apertures from within, closing the edges of the wound, and then put your row of stitches outside, so as to close the part. Next we have an English suture, Bishop's, which is rather complicated, but it has given very good results. This is applied as follows: it was really invented for the intestine. The needle is first put through all the coats (Fig. 17) on both sides of the opening, then the thread is cut, one thread being left in and the other left loose. It is returned back here again, and the opposite loop is cut, then back again, the next loop being similarly divided, then back again, one of the loops being cut as before; then the adjacent threads were tied on alternate sides. Of

course the thread which comes through here would be tied with the corresponding thread of the same loop, the result being a very firm suture, and all the walls drawn firmly together (Fig. 18). Finally there is my own method, adopted in my first case of gastro-enterostomy, published in 1886, and recently come into vogue abroad. Its aim is to unite the two viscera firmly by their serous and muscular coats before the mucous coat is divided, and a possibly septic cavity opened. In the first place a cut of the desired length, eight to ten centimetres,
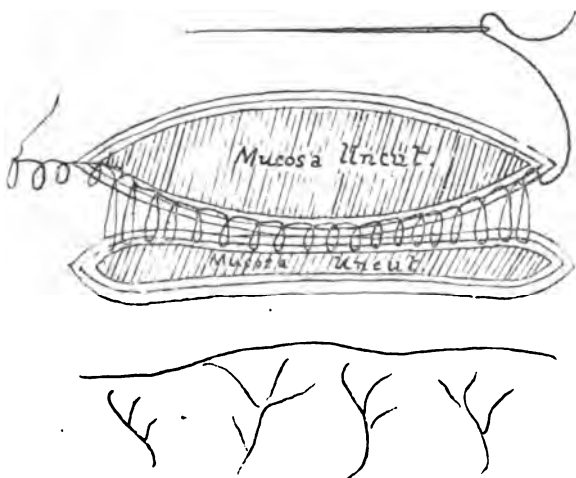
Fig. 19.—Author's method (1886).

is made through the serous and muscular coats of both viscera, but leaving the mucous intact. The two outer layers of corresponding edges are then united by continuous silk suture (Fig. 19). Then the mucous membrane is divided and stitched over the first line on one side of the opening, then on the other. Finally a continuous suture unites the opposite serous and muscular coats, the line being carried well beyond the limits of the opening at both ends.

(*To be continued.*)

Carcinoma of the Lower Lip.—H. Teske ('Centralblatt für Chirurgie,' No. 4, 1898), reporting in an inaugural dissertation twenty-five cases of this affection, recommends in all cases extirpation of the regional lymphatic glands with the aid of an incision extending from the spina mentalis to the larynx, and of additional incisions on each side following the margins of the jaw.

Medicine, April, 1898.

SUPPRESSION OF URINE.

BY

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SUPPRESSION of urine is met with under a great variety of conditions, not only in organic diseases of the kidneys, but also in functional disorders of these organs, and it is important to recognise that suppression and even fatal suppression may occur without the kidneys presenting any signs of gross organic disease on post-mortem examination.

In suppression, as the name implies, the functions of the kidney are arrested, sometimes completely, in other cases and even in fatal cases only incompletely. Thus complete and partial suppression may be recognised clinically. Formerly, and owing more especially to Sir William Roberts's work on the subject, suppression was divided into obstructive and non-obstructive suppression. In obstructive suppression some portion of the ureter was partially or completely occluded, and as a result of this the excretory functions of the kidney ceased. Familiar instances of this condition are afforded by cancer of the uterus involving the ureters by extension, and other pelvic diseases; but suppression is much more characteristic of renal calculus, owing to a stone becoming impacted in the ureter. In these cases of obstructive suppression it must be understood that the secretion of urine ultimately ceases, although at first a hydronephrosis slight in amount may in some cases be produced. It is remarkable that the blocking of the ureter by a calculus leads in some cases to hydronephrosis or to pyonephrosis, and in other cases to suppression, without the production of any previous distension of the kidney. In cases of true obstructive suppression it is not uncommon to find the pelvis of the kidney absolutely empty,— that is to say, that there has been no accumulation of urine above the seat of the obstruction. This true obstructive suppression is perhaps more often seen in cases of calculous anuria than in cases where diseases in the pelvis, such as cancer of the uterus, &c., have led to obstruction of the ureters. Calculi, however, will cause suppression not only when impacted in the renal pelvis, but also when impacted in the course of the ureter, or even at the

orifice of the ureter into the bladder ; and there is at least one well-known case where, as a result of impaction of a stone at the lower end of the ureter of the only acting kidney, fatal suppression ensued, and the ureter was not distended with pent-up urine. Although complete obstruction of the ureter may and frequently does cause complete suppression in the human subject, yet ligature of the ureter in animals invariably leads to the production of a hydronephrosis or pyonephrosis, and I have been quite unable by occluding the ureter experimentally to produce suppression. Even when the ligature was so placed as to occlude the renal pelvis, hydronephrosis invariably resulted.

Non-obstructive suppression, on the other hand, is a condition in which the functions of the kidney cease from a variety of causes, and where post mortem no disease in the excretory ducts of the kidney is found. Familiar instances of this are seen in the suppression that may occur in acute or chronic Bright's disease, and in other grave diseases of the kidney. The recognition of two varieties of suppression of urine was, however, not entirely based on the results of post-mortem examination, but it was held that the clinical features of cases of obstructive suppression differ widely from those seen in non-obstructive suppression. This is a matter not only of theoretical interest, but also of considerable practical importance, inasmuch as many cases of obstructive suppression are capable of more or less immediate relief by surgical interference, e. g. calculous suppression ; whereas in many cases of non-obstructive suppression the outlook is much graver, and surgery is of little or no avail. Thus it is a matter of great importance to distinguish clinically between suppression dependent on obstruction, and suppression dependent on some other condition.

The distinction clinically between cases of obstructive and non-obstructive suppression lies in the fact that in obstructive suppression the patient does not present marked uræmic symptoms, even when the suppression persists until death ; whereas in the cases of non-obstructive suppression it is thought that uræmic phenomena are marked, and lead to a rapidly fatal termination. There can be no question that, as regards obstructive suppression, this view is correct, and

all observers are agreed that these patients do not present the ordinary symptoms of uræmia. It is with reference to the non-obstructive suppression that this older view is in my opinion no longer tenable, and cases may certainly be seen where complete and fatal suppression ensues, and where no obstruction to the ureters, &c., is found post mortem, and yet such cases present the typical clinical picture described as characteristic of obstructive suppression.

Instead of classifying suppression, or of dividing suppression into obstructive and non-obstructive, we must, I think, recognise three varieties of suppression : (1) obstructive suppression ; (2) suppression arising suddenly with kidneys previously healthy ; and (3) suppression occurring as a terminal feature in chronic or sometimes in acute renal disease.

The clinical features of the cases grouped under headings (1) and (2) are similar, and will be described in detail below. The clinical features in the cases grouped under heading (3) are those of fulminating, acute, or subacute uræmia.

(1) *Obstructive suppression.*—Obstructive suppression, as mentioned above, is most usually seen as a result of calculous disease, or as a result of pressure on the ureters in disease of the uterus, ovaries, or of the bones of the pelvis. Calculous disease affords the most common and the most typical variety of this form of suppression. Complete suppression occasionally ensues as a result of the impaction more or less simultaneously of a stone in each ureter. Sometimes a stone becomes impacted in the ureter of the only kidney the patient possesses, but most frequently fatal calculous suppression results from the impaction of a stone in the ureter of the only functional kidney, the functions of the other kidney being in more or less complete abeyance as a result of former disease, and frequently as a result of former calculous disease. The frequency with which congenital malformations of the kidney are seen in patients suffering from renal disease is certainly remarkable. Thus an atrophied and shrivelled kidney on one side, with an hypertrophied kidney on the other, is not an infrequent occurrence, and the impaction of a stone in the ureter of such a kidney will of course necessarily lead to fatal suppression. Further, the impaction of a stone in the ureter of a healthy kidney may, and probably

often leads to atrophy of that kidney. It was thought at one time that complete occlusion of the ureter in the human subject led to atrophy of the kidney, and that incomplete obstruction led to the development of hydronephrosis. Observations carried out on animals by me have, however, shown that the ligature of the ureter is always followed by the production of hydronephrosis or of pyonephrosis; but if the distended kidney be drained by opening the ureter a very perfect atrophied kidney results, the kidney returning to its former shape, but not to its former size, and the atrophied kidney in no way suggests by its appearance that it had ever been hydronephrotic. Hence it is probable that in the cases of atrophy of the kidney in the human subject associated with calculi there has been in the past a hydronephrosis, and then the stone has perhaps been passed, and the temporary hydronephrosis has been followed by atrophy. Experimentally, distension of the kidney for from two to three weeks with subsequent drainage of the ureter is sufficient to lead to the production of permanent and marked atrophy. The fact that the hydronephrosis produced experimentally, and lasting such a short time as two to three weeks, should as a result of draining be followed by permanent atrophy of the kidney is a fact that is of some interest as regards the treatment of hydronephrosis. Experimentally in animals the atrophied kidney produced by these procedures is of little or no use to the animal, although such a kidney will secrete quantities of a dilute acid liquid, but this so-called urine contains a very small amount of the normal urinary constituents; and if the second kidney be excised, leaving the animal with the atrophied organ only, death follows as rapidly as if both kidneys had been removed. In most cases of fatal calculous suppression in the human subject the kidney on one side has been destroyed more or less completely by some such process, and then the ureter of the only remaining kidney becomes suddenly blocked. Such patients, as pointed out by Sir William Roberts, may live for ten days or even longer, and during the greater part of this period they may present but few symptoms pointing to the gravity of their condition. Such patients often retain consciousness and the almost complete use of their mental faculties until near the end : they ·ffer but little from headache; drowsiness,

coma, and convulsions are almost unknown; but myosis, a fall in the body temperature, and towards the end slight twitchings of the muscles are the most prominent symptoms. The contraction of the pupil and the fall in body temperature are, however, by far the most constant and at the same time the earliest symptoms to appear. Occasionally such patients present very slight œdema. This occurred in one case quoted by Sir William Roberts, and I have also seen it once, and in both these cases this œdema diminished before death. Even fatal cases of calculous suppression may pass small quantities of urine from time to time, and this urine is dilute, of low specific gravity, containing but little urea and a trace of albumen. Operative interference in such cases is often followed by the most satisfactory results, the excretory functions of the kidney being regained when the ureter is cleared of the obstruction, or when the kidney is incised and the stone removed. For operative procedures to be successful they should be resorted to early, and it is generally held that operation should not be delayed if possible beyond the fourth or fifth day, although such patients may survive for a week or ten days. Although usually in cases presenting the symptoms described above it is uncommon to see vomiting as a marked feature, yet this may be so; and so extreme may this vomiting be that on more than one occasion cases of complete calculous suppression have been diagnosed as cases of intestinal obstruction, the mistake arising from undue stress being laid upon the vomiting. The similarity between the two classes of cases is really greater than at first sight appears, for both in intestinal obstruction and in calculous suppression the patient may come under observation complaining of pain in the abdomen, vomiting, fall of temperature, and a dry brown tongue. Usually, however, a correct history and a complete and thorough physical examination will lead one to the right diagnosis.

(2) *Sudden suppression arising in previously healthy kidneys.*—Strange as it may seem, complete and fatal suppression may occur in patients where there is no previous gross disease of the kidney, and suppression of this type may be roughly classified as follows.

(a) *Reflex suppression.*—This classification may not be perfectly accurate, but it conveys the idea that the suppression arises as a result of disease of

some other part of the body than the kidney. It is well known that complete and fatal suppression may occur as a result of passing a catheter; and although this very grave complication is more usually seen where there is disease of the kidney, yet it may occur without such disease. Exploratory incision of the kidney may be followed by complete suppression. This has happened where renal calculus has been suspected, and an exploratory nephrotomy performed, the operation has been followed by complete and fatal suppression, and post mortem no stone found, and the kidneys may show no signs of gross disease. This, however, is rare, and it is more usual for this fatality to occur when the kidney explored by the surgeon is one grossly and extensively diseased. Thus I know of a case where calculus was diagnosed, and the kidney was explored and no stone found. The operation was followed by fatal suppression, and on post-mortem examination no calculus was present, but the kidneys showed marked waxy degeneration. Complete suppression may be seen as a result of severe injuries, and also as a complication of various grave diseases,—as, for instance, perforative peritonitis; and in one case seen by me the perforation of a duodenal ulcer in a young man led to a latent purulent peritonitis, which produced no obvious symptoms, and was unrecognised at the time, the patient not being considered to be gravely ill, and then suddenly suppression of urine occurred and death ensued.

Another still more interesting instance of this was seen in a case where, as a result of necrosis of the mucous membrane of a sacculus of the urinary bladder, complete suppression ensued, and this was apparently reflex in its origin, inasmuch as the disease of the mucous membrane was quite localised, and in no way caused obstruction of the ureters, and the kidneys post mortem did not show microscopically any signs of gross disease.

(b) Complete suppression may also result from disturbance of the circulation in previously healthy kidneys. Thus the use of glycerine as an abortifacient may lead to the production of hæmoglobinuria as a result of its toxic action on the blood, and the excretion of the blood-pigment by the kidney may cause complete and fatal suppression. Another case in which circulatory disturbance led to complete suppression was one in which thrombosis of all the arterioles in both kidneys caused

complete necrosis of the cortex of both kidneys and complete suppression of urine.* Complete suppression may also ensue, as in the well-known diphtheritic suppression, as a result of the supposed action of a toxin on the renal structures.

In all these forms of suppression acute uræmia does not usually ensue, notwithstanding the cessation of the renal functions, but the clinical picture presented by such cases is more or less similar to that seen in calculous anuria; and in the cases quoted above, where the suppression occurred as the result on the one hand of cystitis, and on the other hand as the result of thrombosis of the renal arterioles, the symptoms not only resembled but were identical with those seen in obstructive suppression, the patient living in the one case five days and in the other seven, and they neither of them presented any of the more typical uræmic symptoms, such as coma, dyspnœa, and convulsions.

In cases of diphtheritic suppression, and where the suppression has resulted from the use of glycerine, some uræmic symptoms, such as vomiting and drowsiness, are not uncommon, but even in these cases most of the uræmic phenomena seen in the suppression of Bright's disease are conspicuous by their absence.

The fact that when the functions of the kidney are completely arrested, either reflexly through the nervous system, or directly by interference with the circulation, the symptoms produced are those characteristic of obstructive suppression, and not those seen in uræmia, is of great theoretical interest as well as of practical importance. Theoretically these facts tend to show that mere suppression of the renal functions will not of itself lead to uræmia; and practically this is of importance as rendering it difficult to separate with confidence obstructive from at any rate some varieties of non-obstructive suppression.

(3) More or less complete suppression is of frequent occurrence as a terminal phenomenon in many renal diseases,—for instance, chronic Bright's disease, granular kidney, cystic kidneys, tuberculous kidneys, &c. Sudden suppression occurs not infrequently in cases of consecutive nephritis, secondary to urethral and bladder disease, as a result of the passing of a catheter, or other operative interference. In cases of granular kidney the

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* Vide Gulstonian Lectures, ' Lancet,' April 2nd, 1898.

partial suppression is very often dependent on the failure of the circulation; in other chronic renal diseases it is no doubt dependent on the progressive character and destructive nature of the renal lesion. Suppression, partial or complete, at the termination of chronic renal disease is, as is well known, associated clinically with uræmic manifestations. Although this is true, yet acute uræmia may undoubtedly occur in chronic renal disease, not only without complete suppression, but even without partial suppression. In acute Bright's disease, however, suppression is undoubtedly accompanied by the development of acute uræmia, and in chronic Bright's disease partial suppression is peculiarly associated with the development of subacute, chronic, or gastro-intestinal uræmia. It is a matter of some importance that acute uræmia may supervene in chronic Bright's disease without there necessarily being any suppression.

Uræmia associated with the suppression seen as a terminal phenomenon of these renal diseases may be divided into fulminating or acute, and the subacute or chronic uræmia; and the term latent uræmia may perhaps be used for describing the group of symptoms seen in suppression when it arises either as a result of obstruction of the ureter, or in the non-obstructive cases described above as liable to occur as the result of the cessation of the function of more or less healthy kidneys. Thus on this view three fundamental varieties of uræmia would be recognised—the acute, the chronic, and the latent.

In acute uræmia the prominent symptoms are to be referred to the disturbance of the nervous symptoms; in chronic uræmia, on the other hand, the most marked symptoms are those referred to the alimentary canal. The most constant symptom of acute uræmia is undoubtedly the well-known hissing dyspnœa, which may be so severe as to suggest laryngeal obstruction or asthma, but which is apparently of central origin, and not dependent upon any laryngeal or pulmonary obstruction, although post-mortem pulmonary œdema is a constant and marked feature of this condition. Cheyne Stokes respiration is perhaps more often seen in the chronic or subacute uræmia, rather than in acute fulminating uræmia. Violent mania is seen occasionally in acute uræmia, and I have seen two cases in which maniacal symptoms were apparently entirely dependent upon uræmia, and in addition to the mania there was in these cases catalepsy. A peculiar lethargic condition is also not uncommon in uræmia, the patient being conscious and understanding questions, and capable of giving rational answers, but these are given with apparent intense weariness and after a long pause. Coma, of course, as is well known, is a marked symptom of acute uræmia, but usually, however, it is not so profound as that seen in such conditions as cerebral hæmorrhage, &c. Convulsions are frequent, and it is of interest to note that if they are carefully watched, uræmic convulsions, like Jacksonian seizures, usually begin locally. They are most characteristic of the eclamptic state, but they are seen in other varieties of uræmia. Twitchings and cramps, sometimes very severe, are also frequently noticed in uræmia, and it is of some interest that painful cramps may precede the onset of rapid and fatal uræmia. A peculiar symptom of acute uræmia that I have seen once is persistent sleeplessness. This symptom was presented by a young man of twenty-eight, who died of acute uræmia of sudden onset, and where probably the patient suffered from "contracted white kidneys" of long standing; the only other uræmic symptoms seen in this case were vomiting, hiccough, and cramps, but for several days this patient was persistently restless and unable to sleep. In subacute and chronic uræmia the most marked symptoms are nausea, vomiting, diarrhœa, hiccough, and frequently there is Cheyne Stokes respiration. Such symptoms as these may persist for many days, or even for weeks. Acute uræmia, on the other hand, is usually fatal in a very few days, the duration of life being much shorter than in the cases of latent uræmia seen both in obstructive suppression and in the group of cases of non-obstructive suppression described under heading (2) as occurring with previously healthy kidneys.

In all forms of uræmia, acute, chronic, or latent, the fall in body temperature is almost a constant feature, the only exceptions to this being where the uræmia is complicated by some inflammatory disorder, such as pneumonia, or where the fits are very violent and recur frequently; under these conditions fever and even hyperpyrexia may be seen, otherwise the temperature falls to 96° or even to 95°. The tongue

in uræmia and in suppression often presents a very characteristic appearance, being dry and brown with a tendency to crack, the gums often bleeding, so that the mucous membrane of the mouth and tongue is encrusted with the débris of dried blood, and uræmic patients often complain of an exceedingly unpleasant and loathsome taste in the mouth. Rashes, erythematous, scarlatiniform, papular, and even occasionally vesicular, are of frequent occurrence both in suppression and in uræmia; but I have never seen the crystallisation of urea in the sweat, and so encrusting the body, as described by Bartels.

The main conclusions of these considerations is to suggest that suppression occurring with kidneys till then healthy is not accompanied by ordinary uræmia, even when the suppression is complete and fatal; and, on the other hand, that suppression, partial or complete, occurring with diseased kidneys, is followed by uræmia, acute or chronic. Finally, suppression occurring with previously healthy kidneys may depend upon obstruction of the ureters, or upon disturbance of the circulation or innervation of the kidney; and it is not as yet possible to separate these two varieties with confidence by studying only the clinical symptoms seen during the suppression.

Fasting as a Cure for Acute Infections.—
Professor de Dominicis has been forced to the conclusion that the mysterious cause which transforms inoffensive bacteria passing harmlessly through the organism, into virulent pathogenic germs, is the failure of the digestive apparatus to dispose normally of the food. Even the simplest, scantiest diet will produce putrid decomposition if not digested, and the alimentary canal become a toxin factory and a fine culture-medium for the germs to acquire virulence in and entail serious complication. His extensive experimentation has established the fact that animals kept fasting recovered far more rapidly and without complications from acute infections and severe traumatisms, than others in the same conditions, fed as usual or even much less than usual. He forbids all food to his patients in acute infections, especially in pneumonia, if there is any reason to suppose that the digestion will not proceed normally.

Journ. Amer. Med. Assoc., April 2nd, 1898.

ON THE TREATMENT OF SMALL FRAGMENTS OF BONE IN SIMPLE FRACTURES.

BY

W. ARBUTHNOT LANE, M.S.

In a recent lecture on the treatment of simple fractures by operation I referred briefly to the importance of retaining and fixing in position all comminuted fragments, so as to restore the broken bone accurately to its normal form.

I now propose to consider the question a little more fully, and to illustrate it by one or two cases. I think we may assume that the majority of surgeons are still imbued with the belief that they are able to, and do, restore bones to their original form after they have been broken. This creed they do not, however, attempt to raise to the level of a scientific fact, although they have any number of cases on which they can demonstrate it by means of skiagraphy. I have no doubt that in this matter they are very well advised, if they do not wish to discard their superstitions. It is curious how very different are the means that they adopt to obtain what is presumably the same result. Perhaps I cannot illustrate what I mean more clearly than by quoting the words of two distinguished surgeons who have given much thought and attention to the subject. Mr. Pearce Gould, in a paper published in the 'Lancet' of June 12th, 1897, lays down that, "having arrived at a full and correct diagnosis, the next point to attend to is *to reduce the fragments at once, at the earliest possible moment,* remembering that lapse of time always increases the difficulties in doing this, never lessens them, and soon makes them insuperable. *This reduction of the fragments must be complete or perfect at once;* he must not rest in any halfway house, content with improvement to-day in the hope of still further correction to-morrow." Mr. Marmaduke Sheild, whose excellent paper * I have fully considered on a previous occasion, states his practice as follows:—" I may now give a sketch of how I believe a fracture should be treated, and will take as an illustration a bad case of oblique fracture of the leg. In the first place,

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* 'Clinical Journal,' May 15th, 1895.

I long ago learned from the practice of a distinguished surgical baronet *the folly of attempting at once to fix a bad fracture in accurate position. The 'setting,' as the public persist in calling it, should be postponed until the inflammatory effusion has to some extent subsided, and the blood is beginning to be absorbed.*"

Both these observers cling to the old and generally accepted view as to the forces that oppose the reduction of fragments.

For instance, Mr. Pearce Gould states that "the causes of the displacement are either the fracturing force, the action of gravity, or pull of the muscles."

Mr. Marmaduke Sheild holds practically the same opinion. He writes the following:—"Mr. Lane's second point, that the shortening is due to hæmorrhagic effusion and inflammation rather than to muscular contraction, seems to me hardly proved. *Indeed, I cannot but hold that the contrary is the case.* . . . Though muscular contraction may have been overrated in producing the deformity in fractures, I feel sure that the consideration and treatment of it in practice is of the greatest importance." I have merely called your attention to these statements to show that while surgeons hold very similar views as to the mechanical factors that oppose the reduction and retention of the fragments of a broken bone in accurate apposition, yet they would appear to obtain equally good, in fact, if one can interpret their language according to its usually accepted signification, perfect results by methods which to the ordinary mind are mechanically absolutely antagonistic in practice and in principle.

I can quite understand the position of a surgeon of the present day who would argue in something like the following manner:

" I am perfectly aware that, except under special circumstances, we have never been able, and can never hope to be able to restore a bone broken obliquely to its original form, as we imagined, or pretended to imagine we did. At the same time, although the fragments unite in such a manner that their axes form angles with one another, and although there is a variable and often considerable amount of shortening and deformity, yet in the young subject these do not generally prevent the sufferer obtaining in time a very useful limb, and after middle life patients in easy circumstances do

not often suffer more than a moderate amount of pain and inconvenience. I must candidly acknowledge that inquiries made among the working classes show that the results of fracture, especially after middle life, are too often very disastrous to the wage-earning capacity of the individual, such depreciation varying directly with the necessity of a perfect performance of the functions of the damaged part to the particular labour in which he is engaged. On the other hand, I am of opinion that 'if all those who now readily accept the responsibility of treating fractures by manipulation and splints were to attempt to restore these broken bones to their normal form by operative measures, the risk to life and limb would, taken as a whole, be much greater than it is at the present time."

All this I would willingly admit. But I do not understand the position of the surgeon who still asserts that he is able by manipulation and splints to restore bones to their original form, and does not support his statements by facts when such statements are called in question.

Now as to the treatment of separate pieces of bone in a comminuted simple fracture, or of a fracture in which one of the fragments is very small, there can, I think, be no doubt as to the advisability of placing the fragments in apposition and securing them there in most cases.

As a rule small fragments are best restored when the two portions of the shaft have been fastened together. In some cases, however, it is necessary to attach the small pieces to one or to both extremities of the shaft before they themselves can be connected together. How best to retain them in their proper position must vary largely with their form and texture, as well as with the forces tending to displace them.

They may be perforated and sewn to adjacent bone by silver wire, or they may be retained in position by a wire which encircles them and the shaft, or the forcible approximation which is afforded by screw pressure may be requisite. Again, at other times a combination of these may be necessary to serve the purpose.

A good instance of the manner in which a loose fragment may be secured in position is afforded by the following case:

A man of about 23 years of age was thrown from his horse. While on the ground the animal trod heavily on the upper part of the left forearm.

The injury was followed at once by very considerable extravasation of blood, which produced much swelling, rendering it impossible to make out the relation of the several bony points to one another.

The patient complained of great pain in the vicinity of the upper end of the radius when the elbow was flexed, pronated, or supinated.

He was seen by a surgeon very soon after the injury who suspected the presence of some fracture about the upper end of the radius. As it was impossible to make anything out by manipulation, owing to the great swelling of the arm, he had it skiagraphed without delay.

This showed a fracture of the upper end of the radius. The upper fragment was represented by what appeared to be the head of the radius which bore its normal relationship to the humerus. The upper end of the lower fragment was displaced inwards and forwards, and by no manipulative procedure was he able to replace the fragments in apposition. He therefore advised operative interference, and placed the case in my hands.

On cutting down on the seat of fracture it was found that the upper fragment was formed only by the anterior and outer three fourths of the head of the radius. The lower fragment was displaced from the remainder of the head in the manner shown in the skiagram. By dividing the lower part of the orbicular ligament it was possible to replace the lower fragment in position, but it was displaced with great readiness by any movement of the arm.

As the upper piece consisted of articular cartilage with but a thin shell of bone, great care had to be taken to avoid damage to it. After much time had been spent it was at last secured accurately in position by means of silver wire, when the upper portion of the radius was apparently normal in form. After three weeks had elapsed the dressings were removed, when the wound was found to be firmly healed. The upper end of the radius performed its functions normally within the limits of the movements of flexion and extension that were attempted at the time. These were increased in extent daily. It soon became obvious that the amount of rotation, flexion, and extension could not be increased beyond a certain point. In order to discover the factor that limited these movements the limb

was carefully skiagraphed in several positions. It was then found that there was something abnormal about the coronoid process, a portion of which seemed to have been broken off by force transmitted directly by the hoof of the horse or indirectly through the radius. This fragment had apparently become attached to the coronoid process. A small ill-defined area of resistance could be detected by manipulation in this situation.

In this case, although the result obtained is not as perfect as one could wish, it is quite clear that the radial fragment could not have been replaced in apposition by manipulation alone, and that if the fragment had not been restored to its normal position very much greater depreciation in the functions and mechanics of the parts must have resulted of necessity.

Here we had to deal with a perfectly distinct and loose fragment of bone and articular cartilage, which from its shape, texture, and position was most difficult to replace and keep intact in its normal relationship to the rest of the bone, since there was great risk of breaking it. The result gained was very satisfactory and gratifying so far as it went, though one cannot but regret that the skiagraphs taken before the operation showed no evidence of the presence of the second small ulnar fragment.

I have not as yet found it necessary to introduce bone obtained from other sources than the patient into a fracture, but if there was such comminution of the fragments as required the use of lateral supports to retain the bone in its normal form, I should use bone in preference to a metal plate of aluminium such as I have employed previously. The following case, though not one of fracture, illustrates very well the advantages which such a bony support would afford.

A child had suffered from birth from a progressive deformity with loss of power of a forearm, apparently consequent on an undeveloped condition of the ulna. This bone consisted of two parts which were not continuous in direction with one another, but overlapped somewhat. The ulna was in consequence shorter than the radius, the head of which was being displaced outwards and upwards, while its lower extremity projected beyond the ulna to an abnormal amount. I cut down on the shaft of the ulna, freed the fragments for a considerable distance, and brought them into con-

tinuity with one another, so lengthening the bone to a certain extent. In order to retain the fragments in this position a rabbit's femur was split in two and laced with wire to the fragments. The whole arm was then fixed immovably. The advantages which the patient gained from this operation were very considerable both in the functional capacity and appearance of the part, the parents being delighted with the result.

It is easy to see, therefore, that in the event of considerable comminution of such a bone as the ulna, radius, or fibula, the additional security which the use of such bony supports can afford may make all the difference between a good and a bad result.
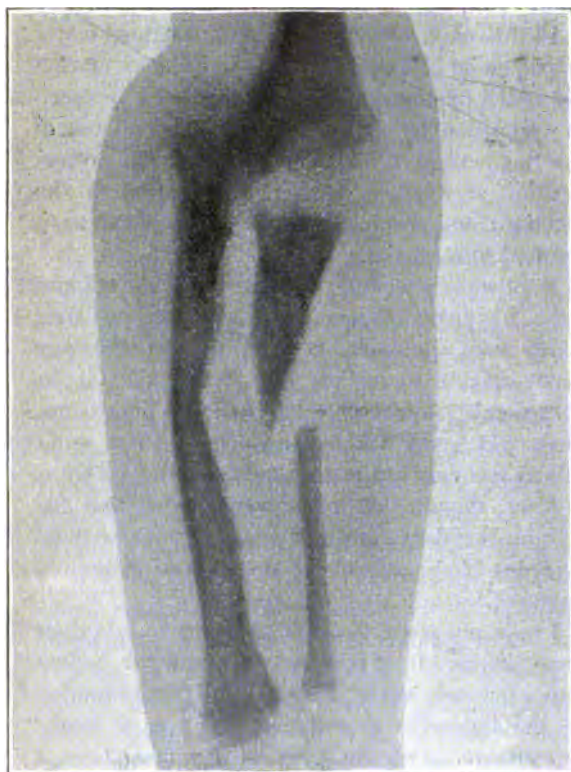
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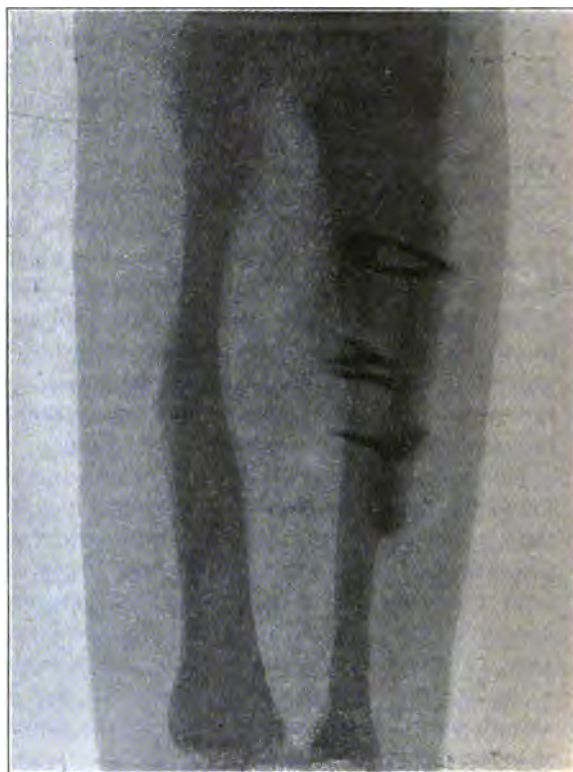
After operation.

WITH
MR. BLOXAM IN THE WARDS OF CHARING CROSS HOSPITAL,

February 17th, 1898.

LADIES AND GENTLEMEN,—This patient is a woman æt. 77, and she presents an unique case. She was brought to the hospital in August, suffering from a strangulation in the femoral region. It is true she has been subject o femoral hernia for some years. The hernia came down on the Tuesday before her admission, namely, six days before we saw her, and when she arrived she was a state of extreme collapse and presented all the symptoms of a person rapidly failing. She had stercoraceous vomiting for several days. On examination a large tumour was found in the femoral region, presenting all the characters of a strangulated femoral hernia, and showing that it had passed a stage further than strangulation, namely, that the part was red and inflamed, and there were other symptoms which pointed to the bowel giving way. She was sent to the theatre at once, and I proceeded to operate. When I divided the structures down to the sac I found all was œdematous and infiltrated and inflamed, and on opening the sac there escaped a quantity of offensive fluid, fæculent in smell and appearance, and on exposure there was a large coil of bowel

which has been preserved for your inspection, and which you will see was gangrenous and all but giving way. We washed the whole of the sac, and made the whole region as antiseptic as we could. The question in my mind was whether I should lay the bowel open and divide Gimbernat's ligament, and leave her in the possession of an artificial anus. But, in view of the advances that surgery has made, I determined to open the sac and cleanse it as much as I could by 1 in 500 perchloride, because if I divided Gimbernat's ligament and left her in that condition, infiltration would probably take place back into the peritoneal cavity. I therefore came to the conclusion that it would be better to do a resection, that is, remove a portion of the bowel. Accordingly I first divided Gimbernat's ligament and pulled the intestine down to beyond the seat of the constriction, then I very carefully divided the mesentery, securing all the vessels by a continuous suture in such a way as to prevent any risk of hæmorrhage. I then pulled the intestine down and clamped both ends, and then cut off the intestine, which you see in this preparation. I then united the intestine by a Murphy's button, which all of you ought to have in your possession, for it is an excellent contrivance. It consists of two portions with an opening through the centre; the intestine is drawn over each portion, and then tied with a silk ligature. Then the two portions of the button are closed together and the surfaces of the bowel are brought in accurate apposition. I had to divide Poupart's ligament, and you see I had to make a fairly large opening to do all I had to do in order to return button and intestine into the abdomen. The operation took me one and a quarter hours. She had the usual difficulties which occur in such severe operations. She had some congestion of the lung, and we had to keep her propped up and to use stimulants, but by the excellent nursing and the close attention and care of my house surgeon you see her to-day before you well recovered. On the thirtieth day she passed the button, and that is the longest time I have heard of a Murphy's button being retained and then passing *per rectum*, the average being about twenty days. The patient will be 78 to-morrow, and I thought you would like to see her and examine the site of the incision and the satisfactory condition of the parts. This operation would not have been dreamt of a few years ago.

The case of this woman, æt. 46, is of interest because although we are always trying to cure cancer and trying to discover its cause, sometimes talking in a very learned way on the matter, we really can do little or nothing, and we know little or nothing.

There has lately been an idea that removal of the ovaries will prevent or delay the recurrence of cancer, therefore I think every case in which such a course has been taken should be seen. We know that when an ovary is removed it does seem to affect the female organism to a great extent. Some cases have been recorded in which removal of the ovaries has caused the cancerous masses to undergo a change for the better. This woman was admitted to the hospital a year ago with cancerous breast—scirrhus. The breast was removed, as you see. The usual incision was made, and I cleared out the glands, particularly in the axilla and the tissue over the pectoralis muscle. When she came back to me in February, she had some recurrent masses like isolated bodies, at first like millet seeds. They were very adherent, and therefore I thought I would explain the matter fully to the patient and give her the opportunity of trying whether removal of the ovaries would bring about benefit. She said she would have no objection to that operation, consequently I performed it for her. At the end of three months I did not notice that much change had taken place in the nodules which we felt in the breast before, especially one situated over the pectoralis muscle. Some thought the nodules had got smaller, while others thought they were of the same size as before. However they remained quiescent until about six weeks ago and then they began to enlarge, and you will be able to feel now that the one over the pectoralis muscle is as large as a hazel nut. They are movable and hard, and present all the characteristics of a scirrhous mass. There is apparently no affection of the clavicles, nor is there any mass to be felt in the axilla. We know that immunity from recurrence of cancer after removal of the breast ranges from eighteen months to three years, but there are instances recorded, where the ovaries have not been removed, in which recurrence has not taken place for ten years and even longer. There is one thing about this patient, however, and that is that since the ovaries have been removed there has been a decided improvement in her general health, and she has gained in

weight. She has not felt any pain or headache, or had any flushings, and there has never been in her any symptoms which would cause one to regard the operation for removal of the ovaries as very serious.

I now show you another woman of the same age—forty-six. You will see that she has cancer of the breast, which has infiltrated the skin more rapidly than is usual, and has already begun to ulcerate. It is fixed, and there is no retraction of the nipple. The glands in the axilla you will be able to feel are typical of the disease. I would like to point out that the proper and only effective way to feel a breast and the glands in the axilla is from behind the patient, passing the hand over the patient's shoulder to feel the breast, and then press the hand *gently* upwards into the axilla to feel for the glands. When the glands are enlarged you are sure to find them along the edge of the pectoralis major, in the axilla, and between the pectoralis major and pectoralis minor along the branches of the thoracic. Her statement is that the trouble has lasted only three months, but we elicit the fact that she has had a "lump" there for two years.

The next patient is a woman æt. 39, who complains of pain in the sole of the foot, and swelling of the legs. She states that since October, when she had an abscess on the tonsils, her legs have swollen, and there is a patch of discoloration on the inner side of the right leg. which is very tender. By pressing with my finger very gently at first and increasing the force imperceptibly, I can dimple the skin there, and the depression remains for some time, as you see. There can be little doubt that she has a localised periostitis. The right leg is hotter to the touch than the other, and there is some sign of congestion. There is no history of a blow on the part. What then is the cause of it ? Periostitis is either the effect of direct injury or set up by organisms entering the blood and becoming developed about the bones and periosteum. Is it a result of the tonsil trouble, or might it be syphilitic ? If it were syphilitic it would probably be clearer, and we should have a history of its very great increase at night, whereas this patient says it is worse in the morning. The patient describes the pain as "rheumatic," which is just the character of the pain of periostitis. She ought to be taken into the hospital

and have something done for it, but there is no room for her. Until then I shall order her some Unguentum Iodini Co. to be smeared over it and kept on the part.

The next case I show you is a very extraordinary one, and as far as I know there are very few instances of such conditions having been shown in this country. This patient has been to almost all the hospitals in London. When he came to me he had very great swelling of his face, so much so on one side that he could not open his eye. The swelling extended round to the back of the neck. He is evidently the subject of lymphangiectasis, a condition of the lymphatics in which the cellular tissue of the face and neck is filled with lymph. The only thing I could suggest was to set up some form of inflammation in the cellular tissue of the skin, and so produce some consolidation of the intercellular spaces. I suggested nitrate of silver because I had found it useful in a similar condition involving the scrotum and the inguinal region, the man afterwards being able to walk about in comfort. I therefore employed nitrate of silver ten grains to the ounce, injecting it at intervals of ten days or a fortnight in various parts of the face and neck. A local inflammatory condition was thus set up, which never came near suppuration, and it is followed by the boy having lost the extreme swelling of the face from which he was suffering, and you will see that the eye is not embedded in the least. The boy will be able to tell you where he has been and what was done to him at the different establishments, and he will tell you that he had electrolysis performed in one hospital. If you press the face in one part the swelling will increase behind the ear, and if you press the back of the neck the face will become more puffy.

The last case I shall have time to demonstrate to you is a baby three months old with double cleft palate. It is well to operate as soon as possible for the double cleft, but in the case of an infant it is unwise to do that until the child has got used to its surroundings, and until we find out what food is best for it, because the digestion of infants is very soon upset, and it would not do for that to happen while it requires all the nourishment it can take after the operation, which may necessitate the loss of a considerable quantity of blood.

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On the Constitution of the General Medical Council and the Council's Circular *re* Foreigners Practising in Great Britain.

By A. G. BATEMAN, M.B.

THE GENERAL MEDICAL COUNCIL must be looked upon almost as a State Institution, as it has so large a proportion of its members chosen by Her Majesty with the advice of the Privy Council. It is probably not generally known that these Crown nominees need not necessarily be chosen from the ranks of the medical profession, and that there is nothing in the Medical Acts to compel the Privy Council to select a medical practitioner, for instance, in the place of the late Sir Richard Quain. The Privy Council, therefore, has a perfect right to replace the whole of its representatives upon the Medical Council by persons not qualified to practise medicine in this country. Further, the representatives of the Universities upon the Council need not be chosen from their medical graduates : they might be selected from those who have never made medicine their study. It is quite possible, therefore, that we might have as the chief authority of the profession a Council consisting of thirty members, sixteen of whom were not upon the Medical Register ; and these sixteen could, being in the majority, make such rules and resolutions as might be absolutely adverse to the interests of the profession. Such an anomaly should never have been permitted to pass through Parliament, and in any future amendment of the Medical Acts it must be made law, that all members of the Medical Council must be qualified and be placed upon the Medical Register. It is to the General Medical Council that the Privy Council turns for skilled advice upon contemplated medical legislation, or upon other matters affecting the rights and privileges of medical practitioners either in this country or abroad, and it is of the utmost importance that such advice should be accurate, legal, and consistent. The General Medical Council, composed, as it happens at the present time to be, of none but medical practitioners, should be able to guide and assist the Government of the day upon all questions affecting medical interests, and for the safety and welfare of the public the Government must be able to place implicit trust in such guidance. Were the Council constituted, as I have stated above, of men outside the profession, one can imagine the errors and mistakes which would be made upon professional matters. One can imagine an Executive Committee composed of military men, artists, or littérateurs, with a President at their head—himself, perchance, an ecclesiastical dignitary—discussing a question referred to them by the Privy Council ; for instance, the terms upon which foreign practitioners are permitted to practise in this country. Naturally taking little interest in the matter, as not affecting themselves, and caring nothing about the preservation of the rights of the duly qualified English practitioners, it is quite easy to imagine such a Committee penning the following as an answer :—" Foreign practitioners can practise medicine in Great Britain without restriction." " The General Medical Council desire to remind the Lord President that foreign medical men are under no restrictions in Great Britain as far as practice is concerned, and that the only disabilities under which they labour if they do not possess a diploma registrable under the Medical Acts are—(*a*) That they cannot recover fees by legal process, and that they cannot sign certain certificates. (*b*) That

they are unable to give medical evidence in courts of law. (*c*) That they may not hold certain public offices. They are absolutely free to practise their profession, not only upon other foreigners, ... but also upon the Queen's subjects and upon foreigners resident in the Queen's dominions." Conceive such a statement emanating from our General Medical Council, misleading, inaccurate, and not in accordance with the various Medical Acts, 1858—1886, or the Apothecaries Act, 1815 ! What a storm of indignation would have been raised, and what earnest steps would have been taken by medical men to prevent the possibility of such false statements being issued again ! A great cry would have been raised as to the danger of the profession being controlled by men who knew not the A B C of the laws which govern medical practice ; and the moral would have been drawn that none but medical men should sit upon the Medical Council in future. And yet it is the fact that the quotations made above have actually been issued as an official statement by the present General Medical Council, consisting entirely of medical men. The statements are to be found, *mirabile dictu*, on pages 117—18, " Minutes G. M. C.," November 22nd, 1892, and are contained in a memorandum prepared by direction of the Council showing the conditions under which foreign practititioners are allowed to practise medicine in England, also in pages 235—36 in a letter signed by the late President of the Council in his official capacity, and addressed from the offices of the Council. The statements referred to were sent to the Privy Council, in answer to a request from that body to be furnished with the regulations which govern medical practice by foreigners in Great Britain, and were required for the information of Continental Governments. It is interesting to note here that these statements were issued without one dissentient voice being heard, and the President was formally thanked for the care he had taken in the preparation of the same. It has since been shown that the Council never "adopted" the report of 1893, but it was entered upon the minutes.

It is further the fact that these misleading and inaccurate reports were sent in to the Privy Council, and by the latter were forwarded to Continental Embassies as authoritative. The Medical Council practically assured the foreigners that there would be no restriction placed upon them by the English laws, and that they could practise with impunity here. Within the Council Chamber no voice was raised against this repeated enunciation of a most serious error, and it was not until Mr. Horsley protested in no uncertain terms against the further letter on Italian practice written by the then President, dated July 1st, 1897, and which letter, it should be observed, was only brought up many months after it had been issued to the Privy Council as an official document, that the evil was in any way stayed. Mr. Horsley opened the campaign on December 30th, 1897, by addressing a letter to Sir Richard Quain, drawing his attention to the fact that the statements made officially to the Privy Council were incorrect, and that foreign practitioners who are unregistered and unqualified cannot practise unrestrictedly medicine, surgery, and midwifery in the United Kingdom. Mr. Horsley showed that the President had overlooked the penal sections of the Medical Act, 1858, and the Apothecaries Act, 1815, both of which had been successfully used against foreigners practising in England without being registered. Mr. Horsley might also have quoted an Act of Henry VIII which prevents persons practising in London and seven miles beyond without certain conditions being observed impossible for foreigners to obtain.

This communication of Mr. Horsley's was not answered, but it is satisfactory to note that the Executive Committee met on February 21st, 1898, practically accepted Mr. Horsley's views *in toto*, and sent a letter to the Privy Council which necessarily contradicted the President's letter of July 1st, which nevertheless they had previously acquiesced in,

and for which they were consequently officially responsible. Mr. Horsley has also given notice that at the coming session of the Council he will move a resolution to rescind the statements made by the late President in conjunction with the Executive Committee, and which appear upon the Minutes. In his letter of protest of December 30th, 1897, Mr. Horsley also pointed out to the President the danger of forwarding to the Privy Council statements which are neither accurate nor in accordance with the existing Medical Acts, since such statements were most likely to prejudice the Government with regard to the Acts, and also to directly depreciate the value which the Privy Council will set upon any further official letters emanating from the General Council. It is most extraordinary that it should have been left to the latest elected member of the Medical Council to expose the inaccuracy of important official communications which have for years been allowed to pass unchallenged ; and it does not speak well for the executive arrangements of the Council that such errors should have been perpetrated. I cannot believe that the opinion of anybody really experienced in the administration of the Medical Acts was taken upon the question ; and if not, it is to be hoped that in future no such important matter will be decided without proper examination by the whole Council and under advice. It must be made impossible for such a regrettable transaction to happen again ; the Medical Council must not permit misleading statements to be issued officially, when a little care and exercise of common sense could prevent this.

It must not be forgotten that these very inaccurate documents have been actually attempted to be used as defence by foreigners, against whom actions have been threatened or commenced by the Medical Defence Union for practising without possession of British diploma. Both the Privy Council and foreigners have been deceived, and it will take some considerable time to undo the mischief which has been created. It is to be hoped that Mr. Horsley will press the matter home, and not rest content until a further circular is issued by the General Medical Council repudiating both the Memorandum of 1892 and the letter of the then President issued July 1st, 1897.

The best thanks of the profession are due to Mr. Horsley for his watchful care over the interests of his constituents. The majority of the General Medical Council are too ready to accept without criticism matters which are brought up as acts done by the President and the Executive Committee during the long interregnum between one session and another. The reason for this is very natural : the session only occupies a week or nine days, and during this short time matters are brought up which could usefully occupy a far greater period. The members cannot afford to give up more of their time from their professional duties, and the business is hurried through too quickly. The expense of a session is very heavy indeed, and even the extraordinary meeting which took place on April 5th and 6th for the purpose of electing a President, and considering the Medicines Bill, must have cost a large sum.

In matters of such import as advice given by request of the Privy Council, want of time cannot be allowed to be pleaded as excuse for inaccuracy, and the folly of not giving full consideration to the necessary details in the cases quoted is only too apparent.

<div align="right">A. G. BATEMAN.</div>

April 19th, 1898.